

**PERSONALITY AND COGNITIVE ADAPTATION:  
THE ABSENCE OF NEUROTICISM AND ITS EFFECTS  
ON THE WELL-BEING OF  
WIDOWED WOMEN OVER TIME**

by

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# APPROVAL

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## **ABSTRACT**

Widows scoring lower on the trait of neuroticism (N; i.e., negative emotional reactivity) tend to score higher on measures of well-being than high-N widows. This study examined if low-N widows employ adaptive cognitive processes (e.g., positive information processing biases) to mediate the association between personality and well-being.

Reports of widowed women's perceptions of their marriage, measured in 2002/2003 by the Marital Aggrandizement Scale (MAS; O'Rourke & Cappeliez, 2002), were compared to their perceptions of their marriage at that time, as recalled three years later, as well as at present ( $N = 47$ ). It was predicted that low-N widows would have higher MAS responses than high-N widows, and that this difference would increase over time.

There was no interaction between neuroticism and time on MAS scores. Scores of high- and low-N widows on measures of psychiatric distress and life satisfaction were different at baseline and demonstrated lesser disparity at Time 2.

**Keywords: cognitive adaptation, marital aggrandizement, neuroticism, widow, bereavement**

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## **GLOSSARY**

BIDR	Balanced Inventory of Desirable Responding
GHQ	General Health Questionnaire
LOT-R	Life Orientation Test - Revised
Marital aggrandizement	A form of cognitive adaptation in which an individual negates negative beliefs and events regarding his or her spouse and marriage.
MAS	Marital Aggrandizement Scale
Neuroticism	Tendency toward negative emotional experience, which includes facets such as anxiety, hostility and self-consciousness.
PANAS	Positive and Negative Affect Schedule
SLS	Satisfaction with Life Scale

## CHAPTER 1: INTRODUCTION

The death of a spouse is one of the most stressful life experiences (Bonanno & Kaltman, 2001; Holmes & Rahe, 1967), a reality of particular salience to older women given that about half of all women over the age of 64 will experience the death of their husbands (Carr, House, Wortman, Nesse & Kessler, 2001). After a period of acute bereavement (i.e., approximately six months), most widows adjust and return to prior levels of well-being; between 20% and 40% do not, however. Despite extensive research on this topic, understanding of the variables that predict who will adapt to conjugal loss as well as understanding of related cognitive processes remains relatively limited (e.g., Lund, Caserta, & Dimond, 1993).

Prior research has demonstrated the negligible contribution of demographic and environmental variables in predicting adjustment to bereavement (Carr et al., 2000; Vachon, Lyall, & Rogers, 1980). In part, this has fostered the reemergence of research on intrapersonal factors as predictors of adjustment to conjugal loss. In addition to phenomenological factors such as absence of pessimism (Barret & Becker, 1978) and perceived control (Stroebe, Stroebe, & Domittner, 1988), personality variables also appear to be significantly associated with the well-being of widows (O'Rourke, 2002). In particular, the absence of neuroticism (i.e., the propensity to experience negative emotions) has been associated with higher well-being. Processes of *adaptive cognitive functioning* are also believed to mediate the association between personality and well-being (O'Rourke, 2005, 2004, 2002).

## **Cognitive adaptation and illusory beliefs**

The theory of cognitive adaptation suggests that certain positively biased cognitive processes—such as excessive perceptions of personal control and unbridled optimism—are associated with both physical and mental well-being (Taylor, 1983). Although accurate encoding and recall of personally-relevant information were once believed to be indicative of psychological well-being (Jahoda, 1958), a growing body of research suggests that positive biases in information processing (i.e., selective attention encoding and/or recall) are not aberrant but adaptive processes that preserve one's sense of well-being in the face of adversity (e.g., O'Rourke et al., 1996). The adaptive value of such biased information processing has been demonstrated with various clinical populations (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000) and, more recently, with older adults (O'Rourke, 2005, 2004, 2002).

In her landmark study with cancer patients, Taylor (1983) demonstrated the benefit of having a positive attitude in the face of adversity. Although many of these patients held positive attitudes, some believed they had been cured of cancer despite medical evidence to the contrary. These illusory beliefs, or *positive illusions*, were associated with greater psychological adjustment as compared to patients holding more accurate beliefs regarding their prognosis (Taylor, 1983). Most noteworthy, this research demonstrated an association between such illusory beliefs and improved physical health outcomes. Subsequent research has demonstrated similar findings with HIV/AIDS patients across the course of the disease (i.e., diagnosis to death; Taylor et al., 2000).

Recently, this theory of cognitive adaptation has been applied to older adults (O'Rourke, 2005, 2004, 2002). In various studies, O'Rourke and colleagues have found

that older adults who endorse statements suggestive of adaptive cognitive processing are more satisfied with their lives than those holding more realistic beliefs. Furthermore, those endorsing such statements had also been diagnosed with fewer chronic health conditions (O'Rourke, 2005, 2004, 2002). As with Taylor's sample of cancer patients, a link appears to exist between illusory beliefs and both the physical and psychological health of older adults.

The theory of cognitive adaptation has also been explored within the context of relationships. Just as accurate encoding and recall of personally-relevant information were once believed to be indicative of psychological well-being, so too was the accurate understanding of a partner's actual qualities (Murray, Holmes & Griffin, 2003).

Idealizing a partner was considered the psychological equivalent of building a house of cards – a fragile construction that turned love into hate when undone (Brickman, 1987). With a more optimistic perspective of idealization, Murray, Holmes and Griffin (1993) looked to research by social psychologists (e.g., Word, Zanna & Cooper, 1974) on self-fulfilling effects of social perception to inform a series of studies that looked at idealization within the context of relationships. Extrapolating from these studies, Murray and colleagues (1993) reasoned that people might create the partners they perceived by idealizing them. Through idealization, illusions become less vulnerable to disconfirmation as the reality to be perceived shifts (Murray et al., 1993).

Murray and colleagues' series of studies on the idealization of partners have produced several seminal ideas. Perhaps most relevant to the current study is the beneficial effect of idealizing one's partner. Those who were able to see both the good *and* bad in their relationship predicted greater satisfaction, suggesting that positive

illusions appear to involve forgiving acceptance of a partner's faults, a key aspect of current therapeutic techniques used to treat marital distress (Murray et al., 2003). The current study attempted to capture evidence of such idealization using marital aggrandizement to operationalize this phenomenon.

### **Marital aggrandizement**

The current study examined the interplay among personality, cognitive adaptation and well-being within the context of conjugal bereavement. To do so, the construct of *marital aggrandizement* was used as the primary measure of cognitive adaptation. Defined as the propensity to negate the occurrence of negative beliefs and events over the course of one's marital history, marital aggrandizement entails a distinct response style by which persons convey an exceedingly positive portrayal of their spouse and marriage (O'Rourke & Cappeliez, 2002). Marital aggrandizement captures a dimension of biased responding separate and distinct from individual beliefs and behaviours (O'Rourke & Cappeliez, 2002), yet incorporates a similar bias in which negative interpersonal experiences are discounted or reframed to assume a meaning antithetical to initial perceptions. Similar to other forms of cognitive adaptation, marital aggrandizement results not from psychopathology but is, instead, believed to serve an adaptive function, being significantly associated with greater life satisfaction and lower psychiatric distress (O'Rourke, 2005, 2004, 2002). It is believed that low-N widows will demonstrate higher marital aggrandizement as well as greater adjustment to widowhood, as measured by greater well-being over time relative to their high-N peers.

## Personality

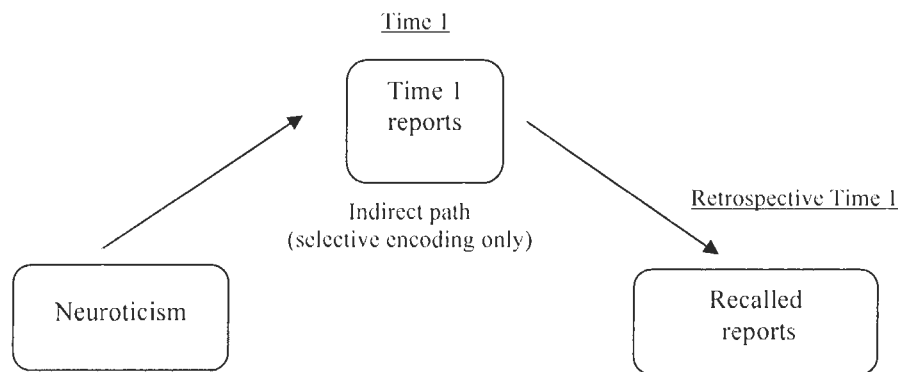
There appears to be a discernible link between certain personality traits and cognitive adaptation, suggesting that personality can facilitate or impede adaptation to loss (e.g., the death of a spouse). Among the *Big Five* personality traits (i.e., openness to experience, conscientiousness, extroversion, agreeableness and neuroticism), neuroticism, extraversion, and openness each appear to be significantly associated with these adaptive cognitions (O'Rourke, 2005), with the absence of neuroticism having the strongest association with cognitive adaptation (O'Rourke, 2002). This finding was replicated in a cross-sectional study with widowed women (O'Rourke, 2004), whose responses served as Time 1 data for the current study. Seventy-seven percent of observed variance in cognitive adaptation was predicted by these core personality constructs (O'Rourke, 2004). This finding provides support for the assertion that cognitive adaptation mediates the association between personality and well-being (O'Rourke, 2004).

Neuroticism refers to a tendency toward negative emotional experience which is particularly salient in studying adjustment to conjugal bereavement. Using factor analysis, two independent research teams (Costa & McCrae, 1985; Norman, 1963) have identified neuroticism as one of five core personality traits. Facets of neuroticism, as determined by Costa and McCrae (1992), include anxiety, angry hostility, depression, self-consciousness, impulsiveness and vulnerability. High-N individuals are more likely to experience negative affect (e.g., fear, sadness, guilt, anger) than their lower-N counterparts, while high-N individuals are also less able to cope effectively with stress than low-N individuals.

## Cognitive adaptation: Bias in encoding or recall?

Most researchers in the area of symptom perception agree that high-N individuals tend to inflate the frequency, severity and/or duration of physical complaints (Costa & McCrae, 1985). Most explanations for this phenomenon focus on the relation between N and the perception of self-reported health status, arguing that the deflation of perceived health occurs at *encoding*, or at the time the symptom is first experienced (see Figure 1 below).

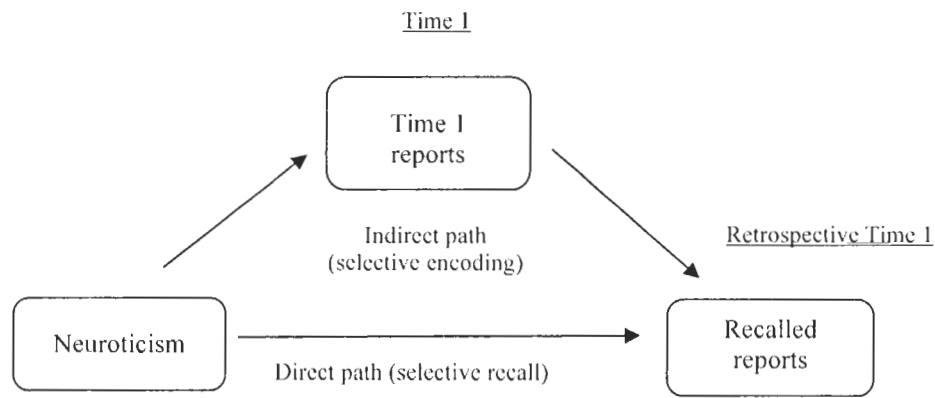
**Figure 1: Selective information processing at encoding  
(no change from Time 1 to Retrospective Time 1)**



This difference in perception and reporting of physiological experiences has been shown in several studies (Lipowski, 1988; Watson & Pennebaker, 1989). What these encoding explanations lack is a consideration of how personally relevant information might be later *recalled* (i.e., remembered at a later date). In an influential study on symptom reporting in a sample of college students, Larsen (1992) showed that in addition to between group differences at baseline, a negative bias was also observed at recall among those high in the trait of neuroticism (see Figure 2).



**Figure 2: Selective information processing at encoding and recall**



As reported by Larsen (1992), not only did high-N persons initially provide higher symptom response levels at baseline, but later recalled symptoms to be even higher than initially reported. This finding suggests that the trait of neuroticism is associated with negative attention/encoding as well as recall biases, which became more pronounced over time (Larsen, 1992).

Larsen's landmark study implies that there is a temporal interplay between personality and information processing. Over time, participants with a propensity to experience negative emotions remember personally relevant information more negatively than first perceived. Larsen's study, while documenting the association between neuroticism and selective information processing at both encoding and recall, focused solely on the negative information processing biases employed by high-N participants. The question remains as to whether or not the opposite might be observed (i.e., more positive recall) among those low in the trait of neuroticism.

The current study used a similar concurrent-retrospective longitudinal research design to build upon Larsen's finding that N is associated with selective information processing and recall; however, the current study aimed to build upon this finding by performing subgroup analyses to compare high- and low-N participants (i.e., testing for between group differences).

Larsen's (1992) study provides compelling evidence to suggest that elevated levels of neuroticism are associated with negative cognitive biases. Might the corollary also be true? That is, are *low* levels of neuroticism associated with correspondingly positive biases in both attention/encoding and recall of personally-relevant information (e.g., perceptions of one's spouse and marriage)? This research question was examined by the current study. More precisely, is low-N is associated with positive biases (i.e., the opposite of high-N)?

### **The impact of mood on selective information processing**

The interplay between personality and selective information processing may also be affected by the current mood of participants at the time responses are provided. Several studies on mood disorders (typically depression or anxiety) have shown an association between mood and biases in cognitive processing of personally relevant information (Dalgleish & Watts, 1990). For example, such studies have found that depressed individuals selectively attend to and remember personally relevant negative information (Dozois & Dobson, 2001). Studies involving non-depressed individuals have also shown an association between mood and recall. For example, Salovey and Birnbaum (1989) found that participants who underwent an unpleasant mood induction reported more illness symptoms than equally ill participants who underwent a pleasant

mood induction. McFarland, White and Newth (2003) found that evaluations of a spouse are also subject to this bias, with a spouse being evaluated more favourably given a more positive mood. Since higher-N individuals are more likely to be in an unpleasant mood (Costa & McCrae, 1980), they are also more likely to selectively attend to negative personally relevant information. The current study examined mood as a possible explanatory variable (e.g., covariate) in order to determine if mood (positive or negative) has an effect on reported levels of marital aggrandizement thus negating the significance of the assumed association between neuroticism and marital aggrandizement.

## **Hypotheses**

Assuming that elevated levels of marital aggrandizement reflect a form of selective information processing and recall among widowed women, recent responses to the Marital Aggrandizement Scale (MAS; O'Rourke & Cappeliez, 2002) will be compared to recall of prior perceptions (i.e., asked to respond the way they felt three years ago) as well as current MAS response levels. Thus three separate MAS response sets will be compared:

1. Time 1 MAS as reported by widowed women approximately three years ago;
2. Retrospective Time 1 MAS as recalled by these women (i.e., recall of how they felt three years ago);
3. Time 2 MAS as now perceived.

Based on these three sets of MAS responses, the following hypotheses are advanced:

1. It is hypothesized that lower levels of neuroticism will be associated with increasingly biased perceptions such that MAS response levels will be

significantly higher at retrospective Time 1, when participants are asked to describe how they felt three years ago about their deceased spouse and marriage.

2. By comparing high-N and low-N widowed women, it is hypothesized that a statistically significant interaction between groups and time will be observed with respect to marital aggrandizement. Not only are MAS response levels assumed to be higher for low-N widows at baseline but it is believed that this difference vis-à-vis high-N widows will be significantly greater when measured at 3-year follow-up.
3. Furthermore, it is hypothesized that a significant relationship between group membership and time will be observed such that marital aggrandizement will significantly increase over time for low-N widows (i.e., current MAS response levels as recorded approximately three years ago relative to current MAS response levels measured at follow-up). In addition, it is hypothesized that this interaction between groups and time, and change over time for low-N widows, will not be negated by adjustment for mood differences as recorded at 3-year follow-up.
4. Consistent with the theory of cognitive adaptation, it is hypothesized that levels of well-being (as measured by life satisfaction, the absence of psychiatric distress, perceived health, and fewer chronic health conditions) will be significantly greater for low-N widows as compared to high-N widows, and that this difference will be greater still when measured at 3-year follow-up.

## **CHAPTER 2: METHODS**

### **Overview of research design**

Many researchers have studied bereavement over the past several decades, for the most part employing traditional cross-sectional research designs (Wortman & Silver, 2001). More recently, various authors and theorists have acknowledged the temporal aspects of adjustment to loss by using longitudinal research to examine adaptation over time. The current study aims to add to the present state of knowledge by using a concurrent-longitudinal design to assess between-group differences of change over time and personality as well as cognitive factors that may predict differences in well-being.

The current study examined if change in marital aggrandizement can be predicted by between-group differences in neuroticism and whether these between-group differences are evident at baseline and increase over time. Most research to date cannot distinguish between selectivity biases at encoding and/or recall because the majority of studies of personality and well-being rely primarily on retrospective reports (Larsen, 1992). For this study, repeated measures analysis of variance (ANOVA) was used to compare individual perceptions of marriage at Time 1, recall of those perceptions (i.e., how previously felt) and current perceptions to ascertain if positive illusions regarding one's deceased spouse and marriage are stable or change over time in relation to the trait of neuroticism (i.e., increase among low-N widows). The association between change in marital aggrandizement and health was also examined.

At Time 1 (2002/2003), the NEO-FFI was administered as part of a larger study of adaptation to widowhood. At that time, participants completed online questionnaires comprising measures of cognitive adaptation such as marital aggrandizement and four measures of well-being (i.e., psychiatric distress, perceived health, life satisfaction, and diagnosed health conditions). Roughly three years after initial recruitment, participants were asked to respond to additional questions including a mood questionnaire. Participants were also asked to think back and retrospectively report on perceptions of their marriage at Time 1 (i.e., respond to the MAS as they did three years before). The strength of this design is that the concurrent and retrospective measures of adaptive cognitive functioning (i.e., marital aggrandizement) are referenced to the same time period in each participant's life, allowing for comparisons over time. This seldom-used longitudinal design was selected to gain further understanding of the relationship between personality, selective biases and well-being over time.

## **Participants**

Participants consisted of 47 widowed women drawn from a total of 213 participants who agreed to be contacted to take part in follow-up studies. A preliminary mailing to these participants indicated that e-mail addresses were current for more than 150 of these participants. A follow-up participation rate of approximately 2/3 was anticipated, in part, due to the use of a \$500 participant lottery. This response incentive has been used previously in web-based studies to facilitate recruitment and retention of participants (O'Rourke, 2002, 2004).

Prospective participants were sent an email message asking them to visit the following URL: [www.sfu.ca/~hgoldber](http://www.sfu.ca/~hgoldber) (see Appendix A for web pages). Data were

collected via this website, constructed specifically for this study. In addition to well-being measures and a mood questionnaire, participants completed the MAS as they currently recall their deceased spouse and marriage, and the MAS from their vantage point three years ago (i.e., as they believe they felt at the point of initial data collection). Since personality in adulthood is largely enduring (e.g., Costa & McCrae, 1986), the current study did not reassess these traits.

Research has shown that there are few demographic differences between older participants responding to web-based questionnaires and those responding to mail-out questionnaires (e.g., O'Rourke, 2002; Gosling, Vazire, Srivastava & John, 2004). These studies would seem to dispel the misconception that participants recruited via the Internet are less demographically diverse than their more traditionally recruited counterparts. Of particular importance to the current study, few differences have been found between web-based participants and traditionally recruited participants with respect to personality and well-being constructs (Gosling et al., 2004).

The average age of the initial study's respondents was 61.42 years ( $SD = 9.04$ ). On average, participants had been married for 26.07 years ( $SD = 12.67$ ) and had been widowed for 8.73 years ( $SD = 8.33$ ). In the initial study, the majority of respondents lived in the United States (58%) with smaller percentages of participants from Australia (30%) and Canada (12%).

## **Operationalization and measurement of variables**

### **Neuroticism**

As mentioned previously, personality variables were measured at Time 1 using the self-rated NEO Five Factor Inventory (NEO-FFI; Costa and McCrae, 1992). The NEO-FFI is an abbreviated version of the NEO-PI-R, which is a well-known and validated measure of the *Big Five* personality traits (i.e., neuroticism, extraversion, openness to experience, agreeability, and conscientiousness). This self-report measure consists of 60 items, 12 items for each of the five traits. Respondents indicate their degree of agreement to each statement on a 5-point Likert-type scale. Scores on each of the five domains range from 0 to 48, with higher scores indicating higher levels of that trait.

This particular study looked specifically at neuroticism which can be defined as the propensity to experience negative emotions as well as susceptibility to fear, sadness, anger, and guilt. Costa and McCrae (1992) reported internal consistency as measured by Cronbach's alpha as  $\alpha = .86$  (neuroticism). Holden and Fekken (1994) reported that each of the NEO-FFI scales had alpha coefficients greater than .70.

### **Cognitive adaptation measures**

#### **Marital aggrandizement scale – MAS**

The Marital Aggrandizement Scale (MAS; O'Rourke & Cappeliez, 2002) was developed as a couples measure of biased responding. The MAS consists of 18 definitively-worded statements, the endorsement of each conveys an unrealistic depiction of marriage. Respondents indicate their degree of agreement to each statement on a 7-point, Likert-type scale. Subsequent to reversal of four negatively-keyed items, one point



is given for each upper-end (i.e., 6 or 7) response, and zero points for both mid-range and low-end responses (i.e., less definitive responses of 5 or less). In this way, only the extremely positive responses, thought to be indicative of marital aggrandizement, are counted toward a total score in accord with the operational definition of this construct. Possible MAS totals range from 0 to 18 with higher scores suggestive of greater marital aggrandizement. For the purposes of Study 1 and the present study, the wording of MAS statements was revised from present to past tense to be appropriate for administration to widows.

Internal consistency has been consistently measured as  $\alpha = .84$ , while test-retest reliability is reported as  $r = .80$  over an average interval of 15 months (O'Rourke & Cappiliez, 2002). Several key demographic factors, including age, years of education, years married, religious denomination and religious service attendance have been shown to be unrelated to MAS response levels (O'Rourke & Cappiliez, 2002).

Participants completed the MAS three times. Participants were asked to complete the MAS based on their current perceptions of their (past) marriage at the time of initial recruitment. Participants completed the MAS a second time, but were given instructions to think back and retrospectively report on their perceptions of their marriage three years prior (i.e., retrospective Time 1).

Counterbalancing of questionnaire presentation (i.e., Forms A and B) was undertaken, particularly since the MAS was administered twice at follow-up (i.e., once to assess current perceptions and a second time to assess retrospective perceptions of one's deceased spouse and marriage). The website was designed so that half the participants complete the two MAS questionnaires in one order (e.g., Retrospective Time 1 MAS

first, Time 2 MAS second), while the remainder completed the MAS in reverse order (i.e., Time 2 MAS first, Retrospective Time 1 MAS second). When completing the second MAS, participants were not able to return to view their answers to the previous MAS. Additionally, 20 minutes of other questions separated the two administrations of the MAS. Comparative analyses were undertaken to measure MAS response levels between counterbalanced forms. It was assumed that no significant between group differences would be observed, thus discounting the confound of order effects.

### **Optimism**

The Life Orientation Test—Revised (LOT-R; Scheier, Carver, & Bridges, 1994) is a 10-item measure of dispositional optimism. Six core items are scored on a 5-point Likert-type scale, three of which are negatively worded and three positively worded. The remaining four items are included as filler items to obfuscate the LOT-R's intent. Total scores range from 0 to 24 with higher scores suggestive of greater dispositional optimism.

Internal consistency of responses to the LOT-R has been reported as  $\alpha = .82$  among older adults (O'Rourke, 2002b). Test-retest reliability has been reported as  $r = .79$  over a 28-month interval, suggesting stability of responses to the LOT-R (Scheier, et al., 1994).

### **Balanced inventory of desirable responding— BIDR Version 6**

The Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1994) is a 40-item self-report instrument comprised of two 20-item subscales (self-deception and impression management). The current study measured self-deception which is believed to be a mode of adaptive cognitive functioning (O'Rourke, 2005, 2002). In contrast,

impression management, or deliberate or purposeful distortion is believed to be a conscious process.

Respondents rated their degree of agreement to each BIDR statement on a 7-point, Likert-type scale. Similar to the MAS, dichotomous scoring was used (i.e., only the extreme answers of 6 or 7 were counted) to ensure that only respondents who give exaggerated responses to highly desirable items attain high overall scores. Internal consistency of responses ranges from  $\alpha = .65$  to  $\alpha = .75$  for the self-deception subscale (Paulhus, 1991), while O'Rourke and Cappeliez (2001) report  $\alpha = .72$  for self-deception scale responses by older married women.

### **Measures of well-being**

Because emotional and physical well-being can be judged on a variety of dimensions, it is challenging to provide a definition that encompasses all essential aspects of this nebulous concept. In past studies (e.g., O'Rourke, 2004), well-being has been assessed using the following domains intended to capture the concept of well-being in the current study: psychiatric distress; life satisfaction; perceived health; and current physical health conditions.

These four components of well-being include self-rated perceptions of both physical health (e.g., chronic health conditions) and emotional health (e.g., life satisfaction). Unlike personality, subjective well-being measures do fluctuate in response to changing life circumstances. In a 6-year longitudinal study, Headey and Wearing (1991) found that positive and negative life events led to concomitant increases and decreases in emotional well-being. Suh, Diener, and Fujita (1996) replicated this finding

and demonstrated that although subjective well-being scales are sensitive to the influence of life events, the effects of these events are relatively short-lived.

### **Psychiatric distress**

Psychological health was assessed using the General Health Questionnaire (GHQ; Goldberg, 1978). The 20-item GHQ comprises 10 negatively and 10 positively keyed items with responses recorded along 4-point Likert-type scales, with possible scores ranging from 0 to 60. The GHQ assesses the inability to carry out normal functions and the appearance of new and distressing life occurrences as opposed to enduring psychopathology (Goldberg, 1978). A split-half reliability coefficient of .90 has been reported for the 20-item GHQ as well as indices of internal consistency ranging from .82 to .90 (Vieweg & Hedlund, 1983). As reported by Vieweg and Hedlund (1983), responses to the GHQ do not appear to be confounded by socially desirable responding.

### **Life satisfaction**

The Satisfaction With Life Scale (SLS; Diener, Emmons, Larsen & Griffin, 1985) measures perceived quality of life. The scale consists of five questions, each with seven answer choices ranging from *strongly disagree* (1) to *strongly agree* (7). Higher totals indicate greater life satisfaction. Internal consistency of responses to the SLS has been reported as  $\alpha = .85$  among older adults. Test-retest reliability over a one month interval was reported as  $r = .84$  (Pavot, Diener, Colvin & Sandvik, 1991).

### **Perceived health**

Self-rated health has been shown to be an effective predictor of mortality in older people in a multitude of studies over the last 20 years (Benyamini & Idler, 1999). In their

review of studies on self-rated health, Benyamini and Idler (1999) showed that in a majority of those reviewed (23 of 27), self-rated health remained a predictor of mortality even when health risk factors were controlled in regression models. The current study assessed perceived health, using four questions from the Canadian Study of Health and Aging.

### **Health conditions**

The physical health of participants was measured using items related to chronic health conditions taken from the Canadian Study of Health and Aging (22 conditions; CSHA Working Group, 2002).

### **Mood measure**

Positive and negative affect were measured using the brief Positive and Negative Affect Schedule (PANAS; Watson & Clark, 1988). The PANAS includes two 10-item scales. Ten items measure positive affect whereas the remaining half measure negative affect. Respondents rate the degree to which they have felt each of the listed feelings and emotions (e.g., interested, distressed, excited, nervous) on a 5-point, Likert-type scale ranging from *very slightly* (or not at all) to *extremely*. The PANAS permits the administrator to adjust the instructions to reflect the time period of interest. Use of the PANAS in the current study was intended to examine the degree to which current mood affects responses on other key measures (i.e., the MAS); therefore, the PANAS was administered using the time instructions, “indicate to what extent you feel this way right now, that is, at the present moment.”

Internal consistency of responses has been measured as  $\alpha = .89$  for the positive and  $\alpha = .85$  for the negative affect scales (Watson & Clark, 1988). Responses to the PANAS show a significant level of test-retest reliability, even in the moment ratings. Moment responses have been measured at  $r = .54$  and  $r = .45$  for the positive and negative affect scales, respectively.

### **Demographics questionnaire**

Since current marital status (e.g., remarriage) might influence one's perceptions of a prior marriage, information pertinent to participants' current relationship status was included in the questionnaire. Remarried individuals were excluded from the current study. Demographic information was also gathered.

### **Data analysis**

The association between neuroticism and selective information processing was assessed by comparing responses to the MAS as measured at Time 1 approximately three years ago, and to participants' recall of prior perceptions at retrospective Time 1. Current MAS response levels were also compared to Time 1 MAS response levels. As stated in the first hypothesis, it was expected that lower levels of neuroticism would be associated with selective information processing—in the form of both encoding and recall biases—relative to perceptions of one's deceased spouse and marriage such that responses to the MAS would be significantly greater at retrospective Time 1 than reported at Time 1. Higher MAS response levels at follow-up were also expected to be associated with lower neuroticism scores.

The remaining analyses represent a point of departure from Larsen's (1992) study. While Larsen used all participants to establish an association between neuroticism and symptom recall, he did not *compare* high- versus low-N participants to determine differences in selective information processing between them. The current study aimed to build upon Larsen's strictly high-N study by ascertaining whether or not low-N participants also employ selective information processing at encoding and recall, but in the form of a positive bias.

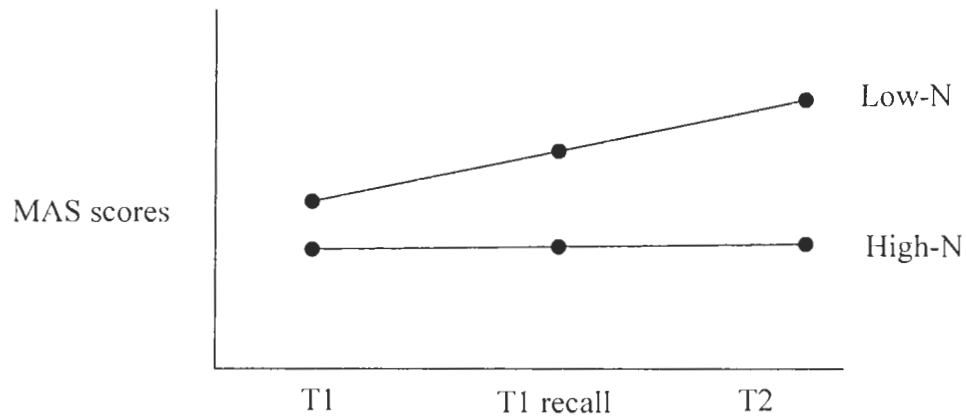
The sample was divided into three approximately equal groupings. The high-N group comprised the 14 participants with the highest neuroticism scores ( $M = 44.64$ ,  $SD = 3.50$ ), as measured by the NEO-FFI at Time 1. The low-N group comprised 14 participants with the lowest N scores ( $M = 24.29$ ,  $SD = 2.79$ ). *t*-test results show that these two groups are, in fact, statistically different ( $t = -17.03$ ,  $p < .01$ ). In a previously reported study of older married women with a mean age of 64.5, the average neuroticism score was 28.52 (O'Rourke, 2005). This suggests that the high and low samples in the current sample are within the tails of the distribution normally seen in this age and gender group of older women.

The 19 participants clustered around the mean were not included in these analyses, allowing for subgroup analyses comparing high- and low-N participants. This sample size was sufficient to detect large effect sizes at  $\alpha = .05$  using a repeated measures ANOVA assuming an average correlation coefficient of  $r = .50$  among independent variables (power = .80; Stevens, 2002).

Not only were levels of marital aggrandizement expected to be higher for low-N widows at baseline, but it was believed that the difference in MAS levels would be

relatively greater when measured at follow-up as compared to high-N widows. No change in high-N participants' MAS levels was assumed due to floor effects (see Figure 3 below).

**Figure 3: Hypothesized interaction between groups by time vis-à-vis MAS response levels**



The interaction between time and group on MAS response levels was assessed using two-way repeated measures analysis of variance (ANOVA). It was expected that upon comparison, low-N participants' MAS scores would be higher than high-N participants' MAS scores, both at Time 1 and retrospective Time 1. Furthermore, it was expected that the difference between low- and high-N MAS response levels would increase over time due to an increase observed among low-N widows. This repeated measures design has several advantages. First, each participant serves as her own control such that fewer participants were needed in this within-subjects design to achieve the same power as a between-subjects design. Within-subjects repeated measures design is also a powerful method for examining change over time.



The current study also addressed the potential weaknesses of repeated measures design. Practice effects, or change in scores that occur when a person is retested on the same measure (i.e., MAS), can create a systematic error associated with the dependent variable. However, approximately three years separates the first administration of the MAS from the second, largely eliminating the possibility of remembering how one previously responded. The two administrations of the MAS at Time 2 (i.e., current MAS and retrospective Time 1 MAS responses) were potentially more problematic due to the relatively short time interval between them and the associated risk of order effects. In addition to separating the two MAS questionnaires by approximately 20 minutes with the administration of other questions, the questionnaires were counterbalanced so that half of the participants complete the current MAS before the recall MAS, and half complete the recall MAS before the current MAS. This enabled testing for order effects.

It was expected that the interaction between group and time on MAS response levels, as well as change over time for low-N widows, would not be negated by statistical control for mood levels as recorded at 3-year follow-up. Mood, as measured by the PANAS, was measured for use as a possible covariate to determine if the hypothesized group by time interaction remains statistically significant. If so, we could then conclude that neuroticism effects recall over and above that which can be explained by mood alone.

The final set of analyses compared high- and low-N widows' well-being, as measured by life satisfaction, absence of psychiatric distress, perceived health, and chronic health conditions. Repeated measures ANOVA were again undertaken to determine differences in well-being at Time 1, and at follow-up. Consistent with the

theory of cognitive adaptation, it was expected that well-being would be higher for low-N widows than high-N widows at Time 1, and that the difference would increase over time.

Larsen's (1992) finding of an association between neuroticism and selective information processing advanced our understanding of how personality can influence recall over time. In answering some questions, however, others arose. Building on the theoretical and methodological foundations of Larsen's (1992) study, the current study aimed to evaluate the association between neuroticism, selective information processing and well-being over time. By examining these associations within the context of conjugal bereavement, findings might be used to inform the development of interventions to treat persistent distress among widowed women.

## CHAPTER 3: RESULTS

Forty-seven respondents out of a potential 213 participated in this follow up study. This sample size was sufficient to perform repeated measures ANOVAs to determine if mean MAS response levels changed over time, and whether or not there were any differences between high and low-N widows at each of the three points. Table 1 below shows descriptive statistics for each of the measures included in this analysis.

**Table 1: Descriptive statistics**

Measure	<i>M</i>	<i>SD</i>	$\alpha$	Skewness	Kurtosis
Time 1 MAS	4.26	4.00	.86	1.13	0.35
Retro Time 1 MAS	4.64	4.25	.87	0.95	-0.08
Time 2 MAS	4.04	3.73	.83	1.09	0.54
LOTR	20.66	4.90	.87	-0.60	0.49
BIDR-SD	6.43	3.48	.52	0.41	-0.40
GHQ	21.72	12.86	.95	0.77	-0.52
SLS	19.15	6.89	.88	-0.22	-0.92
Perceived health	10.91	2.95	.81	-0.03	-1.09
Chronic health	3.06	1.95	n/a	0.48	0.00

*Note:* MAS = Marital Aggrandizement Scale; LOTR = Life Orientation Test, Revised; BIDR-SD = Balanced Inventory of Desirable Responding, Self Deception; GHQ = General Health Questionnaire; SLS = Satisfaction with Life Scale

Although kurtosis is within an acceptable range (Tabachnick & Fidell, 2001), the key MAS variables were slightly positively skewed. Square root transformations were computed for each MAS variable to approximate a normal distribution. Despite the transformation to achieve a more normal distribution (i.e., eliminate positive skewness), the results of the repeated measures ANOVA remained statistically non-significant, suggesting that the skewed distribution was not the cause of the non-significant results. As a result, the original MAS variables were used and reported for all subsequent

analyses. With the exception of the BIDR-SD, all internal consistency estimates were greater than  $\alpha = .8$  indicating good reliability of responses. As previously reported, the average MAS score for married women was 4.69 (O'Rourke & Cappeliez, 2002). As seen in Table 1, MAS values obtained in the current study are lower than this average at each measurement point, indicating that within the current sample, widowed women demonstrated lower levels of marital aggrandizement than the average married woman.

**Table 2: Correlation matrix**

		T1 MAS	Retro T1 MAS	T2 MAS	LOTR	BIDR	GHQ	SLS	Per. Health	Chron. Health
<b>Retro</b>	<i>r</i>	0.79**	1							
<b>T1MAS</b>	$\alpha$	0.00								
<b>T2</b>	<i>r</i>	0.81**	0.85**	1						
<b>MAS</b>	$\alpha$	0.00	0.00							
<b>LOTR</b>	<i>r</i>	-0.02	-0.13	-0.05	1					
	$\alpha$	0.92	0.38	0.75						
<b>BIDR</b>	<i>r</i>	0.25	0.10	0.10	0.10	1				
	$\alpha$	0.09	0.49	0.49	0.48					
<b>GHQ</b>	<i>r</i>	-0.02	-0.03	0.00	-0.47**	-0.57**	1			
	$\alpha$	0.87	0.86	0.98	0.00	0.00				
<b>SLS</b>	<i>r</i>	0.01	-0.11	0.06	0.61**	0.36*	-0.66**	1		
	$\alpha$	0.92	0.48	0.69	0.00	0.01	0.00			
<b>Per. Health</b>	<i>r</i>	0.21	0.13	0.18	0.33*	0.45**	-0.47**	0.56**	1	
	$\alpha$	0.16	0.38	0.22	0.02	0.00	0.00	0.00		
<b>Chron. Health</b>	<i>r</i>	0.00	0.19	0.11	-0.14	-0.17	0.17	-0.38**	-0.59**	1
	$\alpha$	1.00	0.21	0.47	0.34	0.24	0.25	0.01	0.00	
<b>N</b>	<i>r</i>	-0.09	-0.11	-0.04	-0.46**	-0.54**	0.73**	-0.55**	-0.30*	0.13
	$\alpha$	0.57	0.44	0.77	0.00	0.00	0.00	0.00	0.04	0.39

\*\*Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Note: MAS = Marital Aggrandizement Scale; LOTR = Life Orientation Test, Revised; BIDR-SD = Balanced Inventory of Desirable Responding, Self Deception; GHQ = General Health Questionnaire; SLS = Satisfaction with Life Scale; N = Neuroticism

Table 2 above shows the correlations between all continuous study variables. Counterbalancing the two MAS measurements was done by random assignment. Of the 47 respondents, 24 were assigned to one order, and 21 were assigned to the other. For an

unknown reason, there are two respondents for which this information was not collected. *t* tests were computed to measure MAS response levels between counterbalanced forms. Table 3 below shows that the GHQ was the sole measure on which statistically significant between-forms differences were observed ( $t = 2.7, p = .01$ ).

**Table 3: *t* Tests for Equality of Means**

	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error	95% Confidence Interval of the Difference	
								Lower	Upper
<b>T1 MAS</b>	0.56	0.46	0.01	43	0.99	0.02	1.20	-2.40	2.43
<b>Retro T1 MAS</b>	0.23	0.64	-0.12	43	0.91	-0.15	1.26	-2.68	2.38
<b>T2 MAS</b>	5.86	0.02	0.68	43	0.50	0.77	1.12	-1.50	3.03
<b>LOTR</b>	1.98	0.17	-0.25	43	0.80	-0.37	1.47	-3.33	2.59
<b>BIDR</b>	0.00	0.95	-0.79	43	0.43	-0.83	1.05	-2.94	1.28
<b>GHQ</b>	3.69	0.06	2.70	43	0.01	9.74	3.60	2.48	17.01
<b>SLS</b>	0.00	0.99	-0.66	43	0.51	-1.36	2.05	-5.50	2.79
<b>Per. Health</b>	1.99	0.17	0.33	43	0.74	0.29	0.89	-1.50	2.09
<b>Chronic Health</b>	1.57	0.22	-1.01	43	0.32	-0.59	0.58	-1.76	0.58

Note: MAS = Marital Aggrandizement Scale; LOTR = Life Orientation Test, Revised; BIDR-SD = Balanced Inventory of Desirable Responding, Self Deception; GHQ = General Health Questionnaire; SLS = Satisfaction with Life Scale

Although the confound of order effects cannot be ruled out entirely, it is unlikely that the order effect seen in the GHQ will impact the rest of this study, especially since there were no statistically significant between-forms differences found with the Retrospective Time 1 and Time 2 MAS response sets.

It was questioned whether socioeconomic status may affect MAS scores or indices of well-being. Higher socioeconomic status was operationalized as higher income and education levels. Higher levels of education were correlated with higher scores on the LOT-R and lower scores on the BIDR-SD. As would be expected, several of the well-being variables were correlated; however, there were no statistically significant correlations between education and any of the MAS scores. See Table 4 below for the correlation matrix.

**Table 4: Correlation matrix including socioeconomic variables**

	T1 MAS	Retro T1 MAS	MAS3	LOTR	BIDR	GHQ	SLS	Per. Health	Chron. Health	N
<b>Education</b>	-0.07	-0.12	-0.10	0.30*	-0.37*	0.09	0.09	0.00	-0.02	0.02

\* Correlation is significant at the 0.05 level (2-tailed).

To evaluate the association between income and well-being, Spearman coefficients were obtained for the income and each of the well-being variables. Table 5 below shows these results.

**Table 5: Spearman coefficients between reported income and indices of well-being**

Measure of well-being	Income	
	Correlation coefficient ( $r_s$ )	Sig.
Life Satisfaction	.35	.02*
Psychiatric Distress	-.15	.33
Perceived Health	.45	.00**
Physical Health	-.30	.05

\*Correlation is significant at the 0.01 level

\*\* Correlation is significant at the 0.05 level

Income was found to have a moderate, positive correlation with life satisfaction ( $r_s = .35, p < .05$ ) and a stronger, positive correlation with perceived health ( $r_s = .45, p <$

.01). Income also appears to have a moderate, negative correlation with chronic health, bordering on statistical significance ( $r_s = -.30, ns$ ). That three of four measures of well-being appear to be correlated with income corroborates previous findings that one's income can predict the well-being of widowed women (Li, 2004).

### **Possible non-response bias**

Due to a lower than expected response rate, it was necessary to determine if non-responders differed from Time 2 responders. If responders are different than non-responders on variables being measured, than a non-response bias may affect results. However, if no differences exist, responders and non-responders can be assumed to be similar and non-response can be assumed to have occurred at random.

In the current study, non-response comprised both refusals (i.e., received an email and decided not to participate) and non-contact (i.e., email 'bounced' back indicating that individual did not receive email due to change of email address). Although these are two different types of non-responders, they were analyzed as a single group as data regarding type of non-response were not retained.

In addition to cognitive adaptation variables (e.g., Time 1 MAS) and well-being variables (e.g., GHQ), the following demographic variables were included in the non-response analysis: country of origin, education, religion, age, and occupation type, which was used as a proxy for socioeconomic status. Non-response bias was not found for any of the cognitive adaptation or well-being variables. More important, non-response bias was not found for any of the demographic variables. Non-response bias was found in a single variable: Responders had a higher mean score on the openness to experience scale

of the NEO-FFI than non-responders ( $t = 3.42, p < .01$ ). While this variable was not used in the current study, it may still suggest a degree of non-response bias.

### **Testing of study hypotheses**

Participants were divided into three groups based on their neuroticism score from the NEO-FFI administered at Time 1. The first group ( $n = 14$ ) included respondents with the lowest neuroticism scores, while the last group ( $n = 14$ ) included respondents with the highest neuroticism scores. This procedure, as opposed to the median split, was used to distinguish the two most distinct groups of scores possible.

Figure 4 shows the change in MAS scores over time – Time 1 being the MAS scores reported three years ago, Retrospective Time 1 being the MAS score when the respondent was asked to recall how she felt three years ago, and Time 2 being the MAS score when the respondent was asked how she feels today.



**Figure 4: Change of MAS response levels over time**

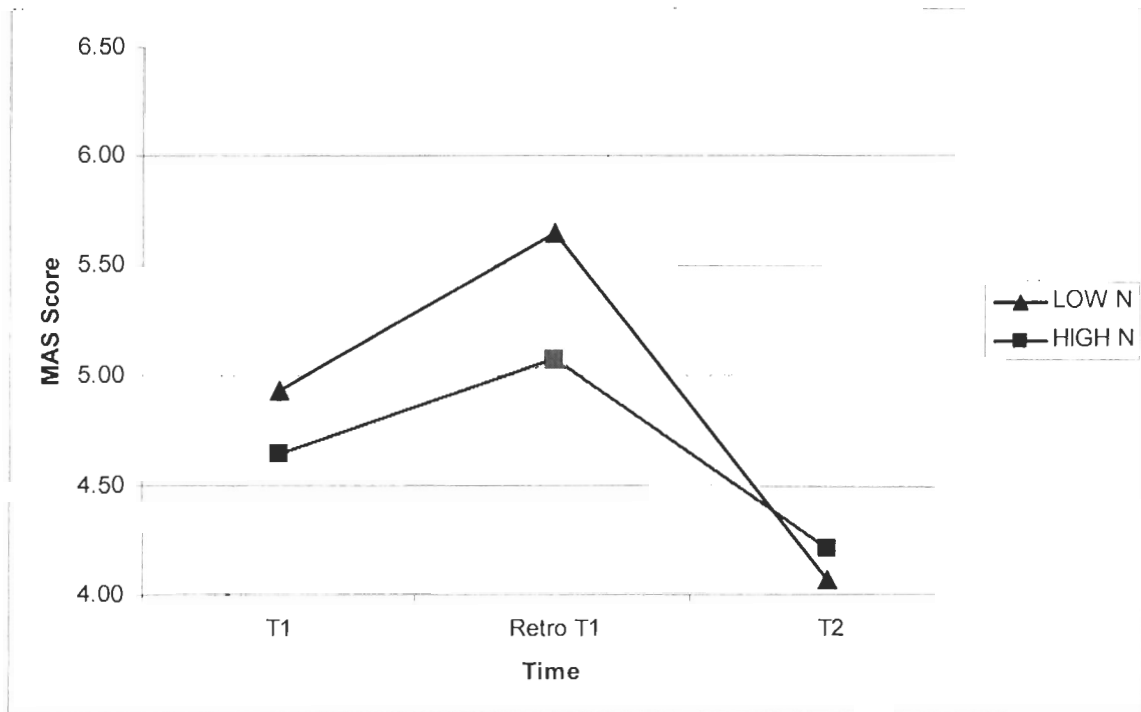


Figure 4 shows that low-N respondents had higher mean MAS scores at Time 1 and at Retrospective Time than their high-N counterparts. Time 2 scores appear to be virtually indistinguishable between the low and high-N groups. It appears that both high and low-N respondents follow a similar trend; that is, mean scores for Retrospective Time 1 increase from Time 1, but then Time 2 scores decrease to a point lower than the baseline score. It should be noted that while the trend looks similar between the two groups in terms of strength and direction, Time 1 scores and Retrospective Time 1 scores appear to be higher for the low-N group.

The second hypothesis predicted that a comparison between high- and low-N widows would reveal a statistically significant interaction between groups and time with respect to marital aggrandizement. In addition to the assumption that low-N widows would have higher baseline MAS scores, it was also believed that the difference vis-à-vis

high-N widows would be significantly greater when measured at 3-year follow up. A repeated measures ANOVA shows that neither within-group differences over time nor between-group differences are statistically significant. Table 6 shows the interaction between time (Time 1, Retrospective Time 1, Time 2) x group (high- and low-N). While the interaction between time and group is not statistically significant, the effect of time on MAS score approaches statistical significance, indicating that there may be an influence of time on MAS scores that was undetectable due to sample size limitations of this study.

**Table 6: Within-subjects effects on MAS scores**

	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
<b>Time</b>	20.67	2	10.33	2.67	0.08
<b>Time x Group</b>	1.81	2	0.90	0.23	0.79
<b>Error (Time)</b>	201.52	52	3.88		

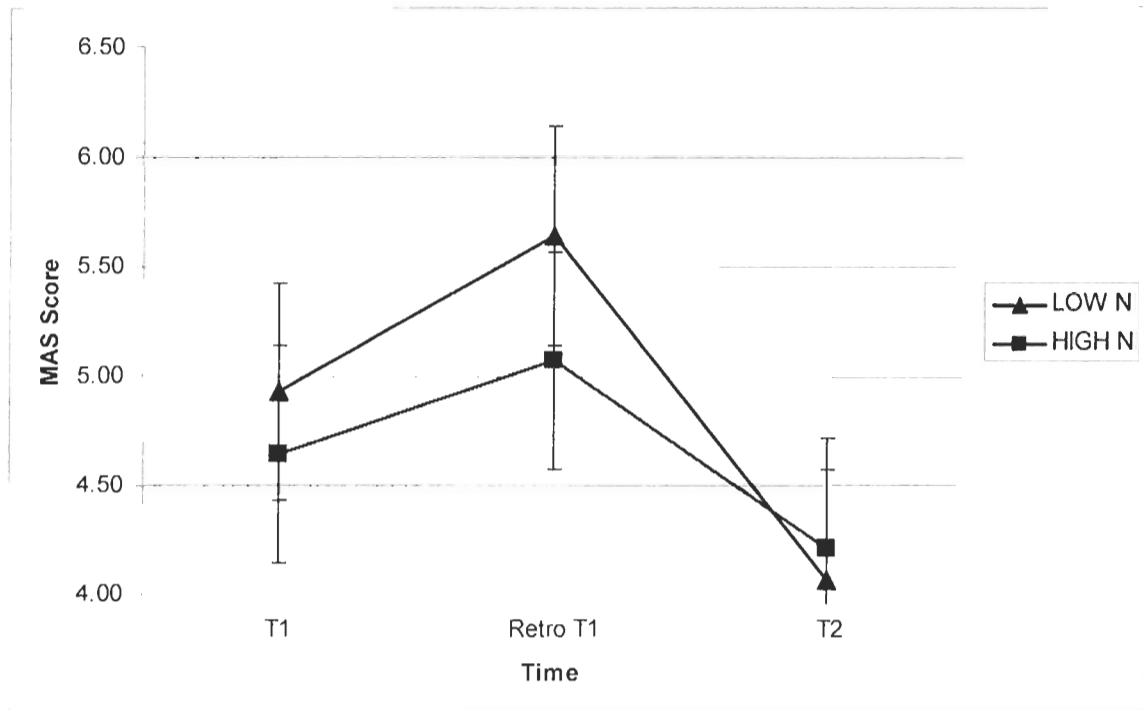
Table 7 below shows the between-subjects effects on MAS scores. No statistically significant effect of group (low- and high-N) was found on MAS scores.

**Table 7: Between-subject effects on MAS scores**

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
<b>Intercept</b>	1904.76	1	1904.76	32.54	0.00
<b>N Group</b>	1.19	1	1.19	0.02	0.89
<b>Error</b>	1522.05	26	58.54		

It is likely that the wide variance of MAS scores contributed to the lack of statistically significant between group differences. Figure 5 includes error bars, indicating the degree of variance (standard error) surrounding mean MAS scores at each of the three points of measurement.

**Figure 5: Variance (Standard Error) of MAS Scores**



The overlap of error bars suggests that while the mean between high- and low-N MAS score may appear to be different, the difference is within the parameters of allowable error due to a wide variance of MAS scores surrounding means. This explains the inability to support the second hypothesis.

The third hypothesis predicted that the interaction between groups and time would be attributable to the low-N widows' increase of MAS scores over time, and not the high-N widows' decreasing MAS scores. However, since no statistically significant interaction exists, it is not feasible to test this hypothesis.

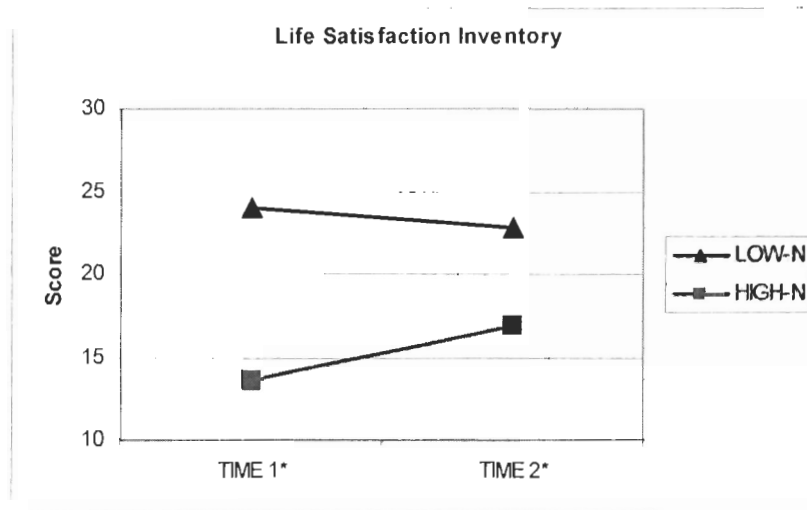
The fourth hypothesis predicted that the interaction between groups and time would not be negated by adjustment for mood differences; however, since no statistically

significant difference between groups exists over time, it was unnecessary to test this hypothesis.

The final hypothesis predicted that levels of well-being (as measured by life satisfaction, the absence of psychiatric distress, perceived health, and fewer physical health conditions) would be significantly greater for low-N widows as compared to high-N widows, and that this difference would be greater still when measured at 3-year follow-up. Repeated measures ANOVAs were run for each of these four measures of well-being. For both Life satisfaction (SLS) and the absence of psychiatric distress (GHQ), a statistically significant group by time interaction was observed; however, no such statistical significance was found for either of the health variables.

Figure 6 shows mean SLS scores for high- and low-N widows at Time 1 and Time 2. The graph shows that low-N widows had a higher mean life satisfaction than high-N widows, and that over time, low-N widows' life satisfaction decreased slightly while high-N widows' life satisfaction increased. Repeated measures ANOVA confirms this, indicating a significant interaction between time and group ( $F = 4.56, p < .05$ ).

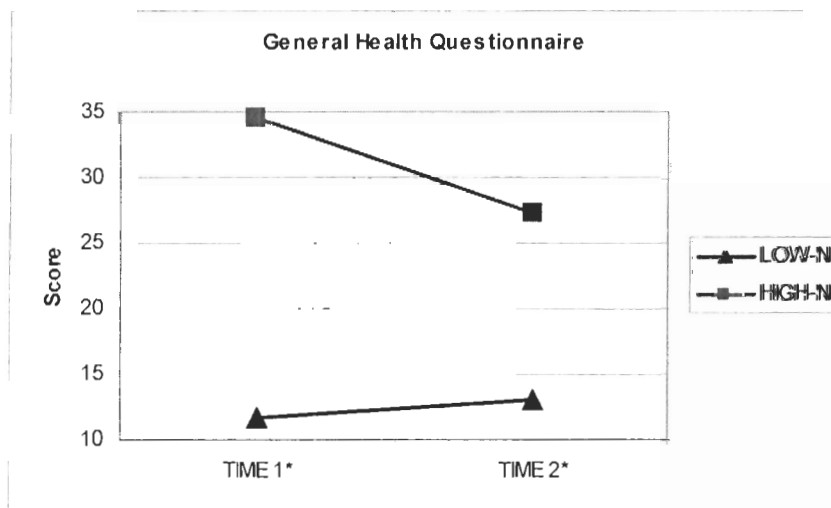
**Figure 6: Life satisfaction over time**



\*Indicates significant difference between high and low N widows at this time

Mean responses on the GHQ can be seen on Figure 7. The graph shows that high-N widows had a higher level of perceived psychiatric distress than low-N widows, and that over time, high-N widows' psychiatric distress decreased while low-N widows' distress increased slightly. Repeated measures ANOVA supports this, with a significant interaction between time and group ( $F = 4.79, p < .05$ ).

**Figure 7: Psychiatric distress over time**



\*Indicates significant difference between high and low N widows at this time

The convergent trend is similar to that seen with life satisfaction, although high-Ns decrease in psychiatric distress over time, while low-N widows have relatively stable mean psychiatric distress scores. While the means between high- and low-N widows are statistically different from one another at both Time 1 and Time 2, this gulf closes over time.

### **Statistical assumptions of repeated measures analyses**

Repeated measures analyses have two primary assumptions. Univariate normality of response distributions assumes that responses for each measure follow a normal curve. Significant skewness or kurtosis violate this assumption of normality on which the ANOVA method relies. Although kurtosis values were within an acceptable range, the distribution was somewhat positively skewed. Transforming the three MAS variables to more closely approximate a normal distribution did not produce statistically significant results; however, the original violation was not an issue as the repeated measures ANOVA involving the MAS measures was not statistically significant.

The second assumption of repeated measures ANOVA is homogeneity of variance, which assumes that variance within each sample is equal. This assumption is relevant in repeated measures ANOVA as there are more than two points of measurement. Repeated measures ANOVAs, unlike independent sample ANOVAs, extend the assumption of homogeneity of variance and assume sphericity as well. Sphericity assumes that variance of difference scores occur at random; sphericity is evaluated by determining if there is compound symmetry of these variances. This assumption is met if covariances are equal and all the variances are equal in the populations being sampled. Sphericity increases the likelihood of Type I errors (i.e.,

incorrect rejection of the null hypothesis) and is thus of concern when statistically significant findings are observed. With multivariate analyses, however, sphericity is not a potential confound (O'Rourke, Hatcher, & Stepanski, 2005).

In the current study, analyses with the GHQ and SLS were the only two to demonstrate a statistical significance (i.e., interaction between group and time); however, since these analyses involved measurement at only two points in time, sphericity is not a concern.

## CHAPTER 4: DISCUSSION

The findings of this study provide mixed support for hypotheses. Contrary to expectations, there was no interaction between neuroticism and time on MAS scores. Although high- and low-N widows' mean MAS scores appeared to be different at Time 1 and Retrospective Time 1, variance surrounding these means obscured detection of the differences.

Perhaps the most surprising finding was the nearly convergent MAS scores at Time 2. The hypotheses on which this study were based predicted that at Time 2, low-N widows' MAS scores would be higher than high-N widows' MAS scores at both Times 1 and 2. It was also predicted that the difference in MAS scores between high- and low-N widows would be greatest at Time 2, due to the dual influence of selective encoding and recall. However, low-N widows' MAS scores at Time 2 were *lower* than those of high-N widows, a result opposite to what was predicted. These results suggest that low-N widows might have used marital aggrandizement to cope during a period of initial bereavement, and that by Time 2, this means of cognitive adaptation may no longer be necessary, reflected in the lower than anticipated MAS scores.

Another unanticipated result was how closely the pattern of high-N widows' MAS scores paralleled that of low-N widows. Although high-N widows had a lower mean MAS score at Times 1 and 2, the change from Time 1 to Retrospective Time 1, and from Retrospective Time 1 to Time 2, closely resembles the direction and pattern of change seen in the low-N group. It was predicted that high-N widows' MAS scores



would remain relatively flat, since an increase in MAS scores at Retrospective Time 1 or Time 2 would indicate the use of selective encoding or selective recall, neither of which was thought to have been used by high-N widows. However, high-N widows' MAS scores appear to increase from Time 1 to Retrospective Time 1, although this change was not statistically significant. This trend suggests that high-N widows might also employ marital aggrandizement, albeit to a lesser degree.

That both high- and low-N widows had statistically indistinguishable MAS scores at Time 2 suggests that this measurement was taken outside of the bereavement period. That is, Time 2 might have been too long after a spouse's death to capture the effects of stress on adaptation to widowhood. The loss of a spouse initiates a period of stress, but most widows return to their previous level of well-being following a period of acute bereavement. At Time 1, the mean number of years between the date of the survey and the date of spousal death was 8.8 years ( $SD = 8.33$ ). This number increases by almost 50% at Time 2 - the mean number of years between the survey date and the date of spousal death increased to 12.2 years. With approximately three years between studies, this number was expected to increase. Future studies might consider compressing the duration of study to ensure the presence of stressors related to adjustment of widowhood; however, this is not to negate the results of the current study. Although unintended, the current study may have traversed both the acute bereavement and post-bereavement period, as indicated by convergent Time 2 MAS scores.

As predicted, there were interactions between neuroticism and time on certain aspects of well-being. Scores of high- and low-N widows on measures of psychiatric distress (GHQ) and life satisfaction (SLS) were disparate at baseline (Time 1).

Measurement at Time 2 indicated less difference between the two groups, mostly due to change in high-N widows. That the low-N widows' GHQ and SLS scores remained stable from Time 1 to 2 was unexpected. The interaction between group and time on well-being measures was predicted to be the result of change in low-N widows, not high-N widows, due to floor effects. Surprisingly, it was the low-N widows who instead may have exhibited 'ceiling effects'. O'Rourke's (2004) study found that widows who held realistic perceptions of their prior relationship expressed lower life satisfaction and greater psychiatric distress as well. While the current study replicated this finding, it may have resulted as a function of the high-N widows' changes over time, not the low-N widows. Figures 6 and 7 show that the high-N widows' scores on the SLS and GHQ demonstrated greater changes over time than the low-N widows.

The aim of this study was not to produce widely generalizable results, but more to examine a complex network of hypotheses within an optimal context. Therefore, only the highest and lowest N-scoring women were included in analyses ( $N = 28$ ), limiting the extent to which one may generalize results. Although the results are drawn from a small, self-selected sample not a representative sample of widowed women, the results still provide insight to how marital aggrandizement may impact the surviving spouse's memory of her partner, as well as her well-being over time.

That greater fluctuation was seen in the GHQ and SLS than in MAS scores may suggest a limitation in measuring marital aggrandizement within this population. Variability in MAS scores - both within and between groups - may reflect a poor fit between this study population and the measurement tool. Additional measures of cognitive adaptation may be included in future studies to examine whether this finding

was unique to this study's sample, or reflective of cognitive adaptation in widows on a wider scale. Additionally, the MAS may not be entirely appropriate given that it measures negation of negative beliefs and events. As previously noted, Murray and colleagues found that seeing both the good and bad in a relationship was predictive of greater satisfaction (Murray et al., 2003), suggesting that the most appropriate measurement tool would measure not solely negation, but acceptance of negative beliefs and events as well.

Overall, the current study finds mixed support for the presented hypotheses. Future studies should build on the trends seen in the current study with a larger sample of widows who are still experiencing adjustment to widowhood. Although the study may have been somewhat hampered by its limited statistical power, the group sizes still permitted the detection of large effects. A greater, possibly insurmountable challenge was presented by the lack of an adverse context in which to examine the study's hypotheses; that is, since some widows were measured at a point in time beyond a typical bereavement period, the crucial context of adversity was not present among all participants. Future studies should ensure a 'freshness' of experience to maximize its impact on measurement (e.g., initial measurement within six months of the death of one's husband).

The study might also have been limited by the method of data collection. Although the internet is a relatively inexpensive means of collecting data, one must be aware of the impact ever-changing email addresses can have on response rates. Email address changes are frequent, and unfortunately, it is difficult if not impossible to ensure email addresses are current over extended periods.

The purpose of this study was twofold: first, it aimed to advance how the relationship between personality, cognitive processing, and well-being over time was understood. Although the interplay between these variables was not wholly elucidated, this study was able to identify some important differences between high- and low-N widows over time, with respect to psychiatric distress and life satisfaction. The second goal was to arrive at conclusions that might have practical implications to inform the development of intervention strategies for widowed women. Although the results from the current study may not be ready for integration within therapeutic strategies just yet, they may still contribute to the development of practical applications by informing the direction of future studies with a similar purpose. For example, this study shows that a widow's level of neuroticism may serve as an important screening tool that can help predict longer term psychological outcomes – including psychiatric well-being and life satisfaction – in the years following the death of a spouse.

# APPENDIX A: ONLINE QUESTIONNAIRE

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## Beliefs and Perceptions of Widowed Persons



Thank you for taking the time to participate in the first part of this study. As described in recent e-mail messages, we now request your participation in Part II of this study.

The following pages ask questions regarding your marriage, well-being, beliefs about the future, and descriptive information (e.g., age, years married, physical health). It is hoped that this information will provide us with greater understanding of the beliefs and perceptions of widowed persons.

If you again agree to participate, you will be asked to complete a set of questions requiring about 25 minutes of your time. Those taking part will be entered into a \$500 participant lottery (odds of winning about 1:100). A summary of findings will be made available to participants upon completion of this study.

You are not required to provide your name. No individual responses from this study will be disclosed; only combined data will be reported. If you have any concerns regarding this study, please contact Dr. Norm O'Rourke (Department of Gerontology) at: [ORourke@ufl.edu](mailto:ORourke@ufl.edu).

Participation in this study is strictly voluntary. You are not required to answer questions that make you uncomfortable and you are free to discontinue at any time. Completion of questionnaires will indicate your willingness to participate.

Thank you for taking the time to consider participating in this study.

With Regards,

Heather Goldberg  
MA Candidate  
[heather@heathergoldberg.com](mailto:heather@heathergoldberg.com)



## Beliefs and Perceptions of Widowed Persons

Welcome to Page 1 of 9

In order to measure change over time, we require that you use the same personal identification word originally used when you first took part in this study.

This word appeared in the e-mail message recently sent to you (in the subject line and in the body of the message). If you don't know your personal identification word, please find it before proceeding.

If required, you can e-mail Norm O'Rourke at: [ORourke@sfu.ca](mailto:ORourke@sfu.ca) who can look up this word for you.

Write your word here: \_\_\_\_\_

[Click to proceed](#)



Think back about three years ago when you first took part in this study. Please answer the following questions from your perspective three years ago (i.e., how you felt then).

Using the response key below as a guide, select the number below each statement which best describes how you felt about your spouse and your marriage three years ago.

- 1 - Not True
- 2 -
- 3 -
- 4 - Somewhat True
- 5 -
- 6 -
- 7 - Very True

1. I cannot imagine having married anyone other than my spouse

click answer     1    2    3    4    5    6    7

2. My marriage was not a perfect success

click answer     1    2    3    4    5    6    7

3. There was never a moment I didn't feel completely in love with my spouse

click answer     1    2    3    4    5    6    7

4. I was completely honest at all times with my spouse throughout our marriage

click answer     1    2    3    4    5    6    7

5. Most times, I knew what my spouse was thinking before uttering a word

click answer     1    2    3    4    5    6    7





click answer     1    2    3    4    5    6    7

15. I always placed the needs and wishes of my spouse before my own

click answer     1    2    3    4    5    6    7

16. I never imagined what it would be like to be intimate with anyone other than my spouse

click answer     1    2    3    4    5    6    7

17. My marriage could have been happier than it was

click answer     1    2    3    4    5    6    7

18. If every person in the world had been available and willing to marry me, I could not have made a better choice

click answer     1    2    3    4    5    6    7



Using the scale below, indicate the appropriate number below each statement to indicate how much you agree with the following statements.

- SD - Strongly Disagree
- D - Disagree
- N - Neutral
- A - Agree
- SA - Strongly Agree

During the past few weeks, have you felt...

1. In uncertain times, I usually expect the best

click answer  SD  D  N  A  SA

2. It's easy for me to relax

click answer  SD  D  N  A  SA

3. If something can go wrong for me, it will

click answer  SD  D  N  A  SA

4. I'm always optimistic about my future

click answer  SD  D  N  A  SA

5. I enjoy my friends a lot

click answer  SD  D  N  A  SA

6. It's important for me to keep busy

click answer     SD     D     N     A     SA

7. I hardly ever expect things to go my way

click answer     SD     D     N     A     SA

8. I don't get upset too easily

click answer     SD     D     N     A     SA

9. I rarely count on good things happening to me

click answer     SD     D     N     A     SA

10. Overall, I expect more good things to happen to me than bad

click answer     SD     D     N     A     SA

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Using the scale below as a guide, provide one response to each statement to indicate how much you agree with it.

- 1 - Not True
- 2 -
- 3 -
- 4 - Somewhat True
- 5 -
- 6 -
- 7 - Very True

1. My first impressions of people usually turn out to be right

click answer     1    2    3    4    5    6    7

2. It would be hard for me to break any of my bad habits

click answer     1    2    3    4    5    6    7

3. I don't care to know what other people really think of me

click answer     1    2    3    4    5    6    7

4. I have not always been honest with myself

click answer     1    2    3    4    5    6    7

5. I always know why I like things

click answer     1    2    3    4    5    6    7

6. When my emotions are aroused, it biases my thinking

click answer  1  2  3  4  5  6  7

7. Once I've made up my mind, other people can seldom change my opinion

click answer  1  2  3  4  5  6  7

8. I am not a safe driver when I exceed the speed limit

click answer  1  2  3  4  5  6  7

9. I am fully in control of my own fate

click answer  1  2  3  4  5  6  7

10. It's hard for me to turn off a disturbing thought

click answer  1  2  3  4  5  6  7

11. I never regret my decisions

click answer  1  2  3  4  5  6  7

12. I sometimes lose out on things because I can't make up my mind soon enough

click answer  1  2  3  4  5  6  7

13. The reason I vote is because my vote can make a difference

click answer  1  2  3  4  5  6  7

14. My parents were not always fair when they punished me

click answer  1  2  3  4  5  6  7

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Below are five statements with which you may agree or disagree. Using the scale below, indicate your agreement by **CLICKING** the appropriate number. Please be open and honest in your responding.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Slightly Disagree
- 4 - Neutral
- 5 - Slightly Agree
- 6 - Agree
- 7 - Strongly Agree

1. In most ways my life is close to ideal

click answer  1  2  3  4  5  6  7

2. The conditions of my life are excellent

click answer  1  2  3  4  5  6  7

3. I am satisfied with my life

click answer  1  2  3  4  5  6  7

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

click answer  1  2  3  4  5  6  7

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

click answer  1  2  3  4  5  6  7

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The next set of questions describe ways that you may have been feeling recently.

- 1 - Not at all
- 2 - No more than usual
- 3 - Somewhat more than usual
- 4 - Much more than usual

Have you recently...

1. lost much sleep over worry?

click answer       1    2    3    4

2. felt constantly under strain?

click answer       1    2    3    4

3. felt you couldn't overcome your difficulties?

click answer       1    2    3    4

4. been feeling unhappy and depressed?

click answer       1    2    3    4

5. been losing confidence in yourself?

click answer       1    2    3    4

6. been thinking of yourself as a worthless person?

click answer       1    2    3    4

7. found everything getting on top of you?

click answer       1    2    3    4

8. been taking things hard?

click answer       1    2    3    4

9. been feeling nervous and strung up all of the time?

click answer       1    2    3    4

10. found at times you couldn't do anything because your nerves were so bad?

click answer       1    2    3    4

11. been having restless disturbed nights?

click answer       1    2    3    4

- 1- More than usual
- 2 - Same as usual
- 3 - Less than usual
- 4 - Much less well than usual

Have you recently...

12. felt capable of making decisions about things?

click answer       1    2    3    4

13. been able to enjoy your normal day-to-day activities?

click answer       1    2    3    4

14. been able to face up to your problems?

click answer       1    2    3    4

15. been able to concentrate on whatever you're doing?

click answer       1    2    3    4

16. felt that you were playing a useful part in things?

click answer       1    2    3    4

17. been feeling reasonably happy, all things considered?

click answer       1    2    3    4

- 1- More than most



- 2 - About the same
- 3 - Somewhat less well
- 4 - Much less well than usual

Have you recently...

18. been managing as well as most people would in your shoes?

- click answer       1     2     3     4

- 1 - Better than usual
- 2 - About the same
- 3 - Less well than usual
- 4 - Much less well than usual

Have you recently...

19. felt on the whole that you were doing things well?

- click answer       1     2     3     4

20. been able to feel warmth and affection for those near you?

- click answer       1     2     3     4

[Proceed](#)

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This scale consists of a number of words that describe different feelings and emotions. Read each item and then select the appropriate answer in the space next to the word. Indicate *to what extent you have felt this way right now, that is, at the present moment*. Use the following scale to record your answers.

- 1 - Slightly or not at all  
2 - A little  
3 - Moderately  
4 - Quite a bit  
5 - Extremely

- |   |                         |                         |                         |                         |                         |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1. Interested ( <input type="radio"/> click answer )  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 2. Irritable ( <input type="radio"/> click answer )   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 3. Distressed ( <input type="radio"/> click answer )  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 4. Alert ( <input type="radio"/> click answer )       | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 5. Excited ( <input type="radio"/> click answer )     | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 6. Ashamed ( <input type="radio"/> click answer )     | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 7. Upset ( <input type="radio"/> click answer )       | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 8. Inspired ( <input type="radio"/> click answer )    | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 9. Strong ( <input type="radio"/> click answer )      | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 10. Nervous ( <input type="radio"/> click answer )    | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 11. Guilty ( <input type="radio"/> click answer )     | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 12. Determined ( <input type="radio"/> click answer ) | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 13. Scared ( <input type="radio"/> click answer )     | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |

- 14. Attentive (  click answer )       1     2     3     4     5
- 15. Hostile (  click answer )       1     2     3     4     5
- 16. Jittery (  click answer )       1     2     3     4     5
- 17. Enthusiastic (  click answer )       1     2     3     4     5
- 18. Active (  click answer )       1     2     3     4     5
- 19. Proud (  click answer )       1     2     3     4     5
- 20. Afraid (  click answer )       1     2     3     4     5

[Proceed](#)



Using the scale below as a guide, select the number below each statement which applies to you, your spouse, or your relationship *from your perspective today*. (i.e., how you feel about your spouse and marriage at this point). There are no right or wrong answers.

- 1 - Not True
- 2 -
- 3 -
- 4 - Somewhat True
- 5 -
- 6 -
- 7 - Very True

1. I cannot imagine having married anyone other than my spouse

click answer     1    2    3    4    5    6    7

2. My marriage was not a perfect success

click answer     1    2    3    4    5    6    7

3. There was never a moment I didn't feel completely in love with my spouse

click answer     1    2    3    4    5    6    7

4. I was completely honest at all times with my spouse throughout our marriage

click answer     1    2    3    4    5    6    7

5. Most times, I knew what my spouse was thinking before uttering a word

click answer     1    2    3    4    5    6    7

6. My spouse never made me angry

click answer  1  2  3  4  5  6  7

7. If my spouse had any faults, I was not aware of them

click answer  1  2  3  4  5  6  7

8. I do not recall a single argument with my spouse

click answer  1  2  3  4  5  6  7

9. My spouse and I understood each other perfectly

click answer  1  2  3  4  5  6  7

10. I never knew a moment of sexual frustration during my marriage

click answer  1  2  3  4  5  6  7

11. My spouse and I sometimes annoyed each other

click answer  1  2  3  4  5  6  7

12. My spouse never made me unhappy

click answer  1  2  3  4  5  6  7

13. Some of my dealings with my spouse were prompted by selfish motives

click answer  1  2  3  4  5  6  7

14. I never regretted my marriage, not even for a moment

click answer  1  2  3  4  5  6  7

15. I always placed the needs and wishes of my spouse before my own

click answer  1  2  3  4  5  6  7

16. I never imagined what it would be like to be intimate with anyone other than my spouse

click answer  1  2  3  4  5  6  7

17. My marriage could have been happier than it was

click answer  1  2  3  4  5  6  7

18. If every person in the world had been available and willing to marry me, I could not have made a better choice

click answer  1  2  3  4  5  6  7

Proceed

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Please indicate your gender  male  female

Your Age  Number of years married

When did your spouse die?  Mo.  Day  Year

How long before your spouse's death did you realize that s/he was going to die?

Was your spouse living in a care facility (e.g., nursing home) at the time of his or her death? (click one ):

No  Yes If yes, for how long:

What is your current marital status: (click one ):

Widowed  Remarried

As compared to the average couple, we were... (click one ):

Less Happy  As happy  More happy

How would you describe the quality of your relationship? (click one ):

Very poor  Somewhat poor  Poor  Satisfactory  
 Good  Very Good  Excellent

How would you best describe your ethnicity (click one ):

- Aboriginal/Native/First Nations
- African/African American/Black
- Asian/Pacific Islander
- Latina/Latino
- Middle Eastern/North African
- White/European
- Mixed/Multi

What is (or do you have) a religious affiliation?

(e.g., Jewish, Roman Catholic):

How often have you attended religious services over the past 12 months?

(if at all):

How many years of formal education did you complete?

What is/was your work or occupation (e.g., housewife, carpenter)?

What is your current employment status (e.g., retired)?

If retired, year you left the paid work force

Total gross family income (all sources) for the past year ( select one category )

- \$ 0 - 9,999
- \$ 10,000 - 19,999
- \$ 20,000 - 29,999
- \$ 30,000 - 39,999
- \$ 40,000 - 49,999
- \$ 50,000 - 69,999
- \$ 70,000 - 89,999
- \$ 90,000 +

How would you say your health is these days? (click one )

- Very poor
- Somewhat poor
- Poor
- Satisfactory
- Good
- Very Good
- Excellent

Is your health better now, about the same or worse than a year ago? (click one ):

- Better
- About the same
- Worse

Would you say your health is better, about the same, or worse than most people your age? (click one ):

- Better
- About the same
- Worse

How much do health troubles stand in the way of doing the things you want to do? (click one ):

- Not at all
- A little (some things)
- A great deal

Regarding your health over the past year, do you have, or have had any of the following conditions. Please indicate either Yes or No as appropriate:

- Allergies of any kind  yes  no
- Fractures or broken bones  yes  no
- Chest problems (e.g., asthma, TB, emphysema, pneumonia)  yes  no
- Heart condition or disease  yes  no
- Kidney trouble (including bladder troubles)  yes  no
- Cancer  yes  no
- Diabetes  yes  no
- High blood pressure  yes  no
- Arthritis or rheumatism  yes  no



- Troubles with your stomach (or digestive problems)  yes  no
  - Stroke or the effects of a stroke  yes  no
  - Parkinson's disease  yes  no
  - Other problems not mentioned  yes  no
- If yes, please specify \_\_\_\_\_

submit

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**Thank you. You have completed the survey!  
Your data have been saved**



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