The Effect of Context and Self-Esteem on Decision Making Competence and Preferences for Collaborative Decision Making in Older Adults

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THE EFFECT OF CONTEXT AND SELF ESTEEM
ON DECISION MAKING COMPETENCE AND PREFERENCES FOR
COLLABORATIVE DECISION MAKING IN OLDER ADULTS

DISSENTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in
Gerontology at the University of Kentucky

By
Christopher C. Gayer

Lexington, Kentucky

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and John F. Watkins, Professor of Gerontology

Lexington, Kentucky

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ABSTRACT OF DISSERTATION

THE EFFECT OF CONTEXT AND SELF ESTEEM ON DECISION MAKING COMPETENCE AND PREFERENCES FOR COLLABORATIVE DECISION MAKING IN OLDER ADULTS

Older adults increasingly face difficult decisions in life threatening contexts as they move closer to death, become more likely to be diagnosed with life threatening diseases, and encounter more death within their social network (Greenberg, 2011). The purpose of this research was to understand the effect of a life-threatening decision context centered around cancer, self-esteem, other individual difference factors and cancer experience on older adults’ decision making competence, and preferences for collaborative decision making.

Study participants were recruited through online circulation of the study recruitment flyer and in-person solicitations at meetings and other events at community locations (senior centers, civic group centers, and churches, etc.). Participants age 55-90 (N=202) were randomly assigned to either a mundane or life threatening condition and asked to complete the corresponding survey packet containing a measurement questionnaire. Analyses consisted of a series of analyses of variance (ANOVA) and regressions. The dependent variables were 3 major components of the DeBruin et al. (2007) Adult Decision Making Competence Scale: (a) Resistance to Framing, (b) Resistance to Sunk Cost Bias, and (c) Over/under confidence, in addition to a measure of Maximizing Tendency (Diab et al., 2008).

Analyses revealed mixed results. Decision context did have an effect on decision making competence, while self-esteem showed little effect. No main effects or interactions were found between decision context, self-esteem, and preferences for collaborative decision making. Individual difference factors did effect decision making competence, with future time perspective, risk tolerance, and ego-integrity emerging as significant predictors. Furthermore, compelling results emerged pertaining to the effect of previous cancer experience on decision making competence.
Results highlight the lasting effect of context and a previous cancer diagnosis on decision making competence and have implications in health care, psycho-oncology, and treatment decision making domains.

KEYWORDS: Decision Making Competence, Collaborative Decision Making, Individual Differences, Cancer, Older Adults
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Chapter One: Introduction and Overview of Dissertation

As the United States population rapidly ages, and the lifespan continues to increase, there is a need to understand older adults’ decision making abilities and deficits. Sound decision making during later life can help to prevent major disruptions to overall physical and psychological well-being, while repeated poor decision making can reduce well-being, and lead to the confiscation by others of the power to make decisions (Finucane & Lees, 2005). The purpose of this dissertation is to expand our understanding of older adults’ decision making by examining the effect of context, self-esteem, other individual difference factors and cancer experience on decision making competence and preferences for collaborative decision making. This chapter begins with a background of the intersecting literatures that identify the problem at hand and provides the theoretical foundation. Also, it describes the statement of the research problem, gaps in the existing knowledge, and the significance of the study to the decision making and gerontological fields.

Background

Throughout the lifespan, the abilities to judge and decide are fundamental higher order cognitive abilities, upon which both quality and length of life are directly contingent (Sanfrey & Hastie, 2000). The ability to make good decisions requires the possession of several key skills including: (a) belief assessment, which involves judging the likelihood of possible decision outcomes; (b) value assessment, which involves evaluating and prioritizing possible decision outcomes; (c) integration, which involves the ability to combine beliefs and values in order to make a choice; and (d) meta-cognition, which involves knowing the extent of one’s own cognitive abilities (DeBruin,
Parker & Fischoff, 2007; Edwards, 1954; Finucane & Lees, 2005; Raiffa, 1968). The collective possession of these four critical skills is referred to as decision making competence. These skills are instrumental in the often-difficult decisions older adults face regarding their health, finances, and living situations (DeBruin, Parker & Fischoff, 2010). This may be especially true for medical and financial decisions, which increase in both frequency and importance with age (Sanfrey & Hastie, 2000).

Yet, in spite of the need for decision making competence with increasing age, researchers generally agree that age is associated with a decline in decision making abilities (Thornton & Dumke, 2005). A multitude of studies have shown that, compared to younger adults, older adults tend to consider and use less information, reconsider previously considered information with less frequency (Finucane, et al., 2005; Johnson, 1990; Meyer, Russo & Talbot, 1995; Patrick, 1995), and require more time to make equal quality decisions as younger adults (Johnson, 1990).

Another potential cause of decision making competence decline is stress outside a certain range of normality. Important decisions frequently give rise to intense intrapersonal conflict as individuals weigh the goals they wish to attain against the threats they wish to avoid (Janis & Mann, 1977). Historical analyses (Holsti, 1972), behavioral observations (Janis, 1982), and experimental evidence (Broadbent, 1971) offer countless examples of situations in which individuals under stress fail to adhere to the basic tenants of rational decision making, opting instead for unnecessarily irrational and/or risky alternatives. Overall, there is ample evidence to suggest that decision makers are adversely affected by psychological stress outside of a certain range of normality. Although the type of decision that causes heightened levels of stress or conflict differs
across individuals, the fear of death is one source of stress thought to be a universal source of conflict and anxiety (Greenberg et al., 1992).

Terror Management research has produced a multitude of evidence demonstrating the powerful negative impact of death related thought on decisions and corresponding behaviors. Terror Management Theory asserts that the fear of death is a fundamental source of human conflict and anxiety (Greenberg et al., 1992), which human beings unconsciously and automatically manage by reframing the world as being both permanent and meaningful, and by thinking of the self as a significant being (Solomon, Greenberg & Pyszczynski, 1991). Terror Management theorists argue that death-related anxieties are kept under control by the constant self-reminder that the world and self are both meaningful and stable (Solomon, Greenberg & Pyszczynski, 1991). In point of fact, the mortality-salience hypothesis derived from Terror Management Theory provides evidence to support this notion.

The mortality salience hypothesis states that stably high or temporarily raised self-esteem acts as a buffer against death anxiety (Greenberg et al., 1992). This hypothesis has been supported by a number of empirical studies. For example, in an initial experiment testing this hypothesis (Greenberg et al., 1992) participants were given false feedback about their personalities that was either extremely positive or mildly positive. After watching a neutral video portraying scenes of death and completing an anxiety scale, those who had received mildly positive feedback exhibited much higher anxiety in response to the video than those who received extremely positive feedback. These findings were replicated in two follow-up studies utilizing anticipation of electric shock as the threatening impetus, and the bio-marker of skin conductance as the anxiety
indicator. Both studies showed that boosting self-esteem eradicated the increased skin
conductance typically encountered in response to electric shock threat (Harmon-Jones et
al., 1997; Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004). Thus, the extent
to which death related thought negatively effects individuals’ decision making
competence and corresponding behaviors may, in large part, be mediated by the self-
esteeem.

In addition to age being associated with a general decline in decision making
abilities (Thornton & Dumke, 2005), older adults are also more likely to experience
heightened stress and conflict in their decision making as a function of their increased
likelihood of encountering decisions in which death is a factor. Yet, in spite of the
heightened potential for declining decision making competence with increasing age, there
is evidence to suggest that older adults may be capable of compensating by relying on the
involvement of others in their decision making process.

It has been suggested that collaborative decision making--involving others in the
decision making process rather than relying entirely on the self--may serve as an adaptive
function allowing older adults to compensate for cognitive declines that occur with
increased age (Henkel & Rajaram, 2011; Meegan & Berg, 2002). Collaborative decision
making examines decision making as a social process, rather than as a solely individual
endeavor (Strough & Margrett, 2002). In daily life, decision making is frequently a
social activity (Berg, Meegan & Deviney, 1998; Meacham & Emont, 1989) wherein the
decision maker engages others actively, directly, and mutually (Meegan & Berg, 2002) in
the process of making a decision or solving a problem. Despite the potential to benefit
from collaborative decision making, not everyone wants to involve others in the process.
Thus, preferences for collaborative decision making may be the key determinant of the extent to which individuals benefit from this compensatory strategy. Findings from research on older adults’ preferences to collaborate when making decisions in various situations have been mixed. Some studies suggested that older adults were more likely to prefer to use strategies that involve self-initiated actions (Berg et al., 1998), while others found that older adults were more likely to include and rely on others to solve their problems compared to younger adults (Denney & Palmer, 1981). Still, other studies suggested that there were no significant effects of age on preferences for collaborative decision making (Berg et al., 2003).

When the combined literatures pertaining to decision making competence, age, Terror Management Theory, and collaborative decision making are examined and the implications for older adults are considered, a clear problem emerges. These literatures suggest that there is potential for age-related changes and life-threatening decision contexts to have a cumulative negative effect on older adults’ decision making competence.

**Statement of the Problem**

There are a number of important points that collectively justify the need for the current dissertation research. First, Terror Management research suggests that fear of death is a fundamental source of human conflict and anxiety (Greenberg et al., 1992) and that death related thought has a powerful impact on individual decisions and corresponding behaviors (Harmon-Jones et al., 1997; Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004). Second, research has indicated that decision makers are deleteriously affected by psychological stress outside of a certain range of normality.
Third, the gerontological literature generally agrees that age is associated with a decline in decision making abilities (Thornton & Dumke, 2005). Finally, age naturally brings the reality of death into view as a function of the ever-increasing proximity to death and the heightened likelihood of having encountered death within the social circle (Greenberg, 2011).

Given these points, there is a need to investigate the extent to which older adults may or may not be particularly disadvantaged when making decisions in which death is a factor. Despite this need, there is a gap in the existing knowledge pertaining to how older adults’ decision making competence and preferences for collaboration are impacted by life-threatening decision contexts, and how self-esteem and other individual differences may effect that relationship. Further, despite the empirical support for the main tenants of Terror Management Theory, it has yet to be applied to decision making models of older adulthood.

**Purpose of the Study**

This research sought to provide better understanding of the effects of decision context, self-esteem, and individual differences, on older adults’ decision making competence and preferences for collaborative decision making. This study employed an experimental design with random assignment into one of two conditions, life-threatening or mundane. The participants were community-dwelling men and women aged 55-90 years. Upon recruitment and consent, participants were randomized to one of the two conditions, and mailed the corresponding survey packet. Participants completed measures designed to evaluate (a) self-esteem, (b) decision making competence, (c) preferences for collaborative decision making, (d) future time perspective, (e) self-rated
affect, (f) risk tolerance, (g) subjective appraisal of decision making competence, and (h) ego-integrity. Participants also responded to questions about their personal demographics and previous experience with cancer.

Significance of the Study

Extending knowledge surrounding older adults’ decision making competence is significant for a number of reasons. First, describing the relationship between age and decision making competence is critical for identifying individuals whose decision making abilities are impaired, and who therefore may be unable to make optimal decisions (Finucane & Lees, 2005). Second, understanding how older adults’ decision making competence is impacted by life-threatening decision contexts, in which they are increasingly likely to face significant decisions, is an important first step for integrating the Terror Management and gerontological fields. Gaining a clearer understanding of the whole picture, including the factors that may moderate the relationship between age and decision making competence, will help inform the current state of knowledge in the field. This knowledge can then be used in the development of interventions aimed at altering the effect of these moderators on decision making competence in older adults.

Summary

There is a need to investigate the extent to which older adults may or may not be particularly disadvantaged when making decisions involving death. Despite this need, there is a gap in the existing knowledge pertaining to how older adults’ decision making competence and preferences for collaboration are impacted by life-threatening decision contexts, and how self-esteem and other individual differences may impact that relationship. The purpose of this research is to fill this gap in the existing knowledge,
and further the current state of understanding around decision making competence in older adults by characterizing the effect of context, self-esteem, other individual difference factors and cancer experience on older adults’ decision making competence, and preferences for collaborative decision making.

The organization of the rest of this dissertation is as follows. Chapter Two provides a detailed review of the relevant literatures and theories pertaining to decision making competence in older adults, preferences for collaborative decision making, and other key variables of interest. Chapter Three presents the specific aims and hypotheses and Chapter Four contains the details of the methodology. Chapter Five is devoted to data analyses and the results of the dissertation. Lastly, Chapter Six focuses on a discussion of the relevance of results in the context of specific aims and expected outcomes and limitations of the dissertation and recommendations for future research.
Chapter Two: Review of the Literature

This dissertation characterizes the effect of context, self-esteem, individual difference factors and cancer experience on older adults’ decision making competence, and preferences for collaborative decision making. The following review highlights relevant literatures pertaining to the key dependent and independent variables and forms the foundation for the research questions, aims, and hypotheses proposed in Chapter Three.

Self-esteem

Self-esteem refers to an individual’s emotional evaluation of his or her own self-worth (Rosenberg, 1965). Both historical (Adler, 1930; Allport, 1937) and contemporary (Greenberg et al., 2003) scholars in psychological science have agreed that the desire for self-esteem is a fundamental human motivation that drives a great deal of human behavior and thought (Greenberg et al., 2008). Individuals deploy a number of psychological mechanisms in order to preserve self-esteem (Sedikides & Gregg, 2010), including attributing successes to internal factors and failures to external factors (Snyder et al., 1976), over exaggerating their abilities (Brown, 1998), self-handicapping to protect against the prospect of failure (Arkin & Oleson, 1998), and projecting qualities feared in the self onto others (Schimel et al., 2003).

The interest in self-esteem in this dissertation concerns the extent to which it impacted the relationship between decision context, decision making competence, and preferences for collaborative decision making. In a series of early Terror Management experiments, Greenberg et al. (1992) found that higher self-esteem reduced death related anxiety, an effect that has since been dubbed the anxiety-buffer hypothesis. This
hypothesis has been supported by a number of empirical studies (Greenberg et al., 1992; Harmon-Jones et al., 1997; Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004). These researchers have also found higher self-esteem to be associated with a decreased use of defense mechanisms in response to reminders of death (Greenberg et al., 1993; Harmon-Jones et al., 1997). Related research indicated that reminders of death increase individuals’ desire for self-esteem enhancement (Martens, Goldenberg & Greenberg, 2005). Self-esteem may also impact the extent to which individuals prefer to involve others in their decision making.

As self-esteem relates to preferences for collaborative decision making, research suggested that those who believe they have a good capacity for making decisions are likely to rely on their own resources for doing so, rather than involving others in the process (Blanchard-Fields et al., 1997). How self-esteem might impact preferences for collaborative decision making in the context of potentially life-threatening decisions is unclear. The research of this dissertation sought to understand the interplay between self-esteem, decision context, and preferences for collaboration in order to add to the decision making literature and gain a fuller understanding of the relationship between context, self-esteem, and collaborative decision making.

**Decision Making Competence**

The continued ability to make sound judgments and decisions has direct implications on both quality and length of life (Sanfrey & Hastie, 2000). Everyday decisions regarding diet, exercise, health care, health behaviors, and lifestyle exemplify this notion. Strong decision making capacity remains critical with increasing age in that older adults face many situations that require making important and complex decisions.
Medical and financial decisions in particular increase in both frequency and importance with increasing age (Sanfrey & Hastie, 2000). Poor decisions in these (medical and financial) decision domains have the potential for more dramatic and lasting effects as the amount of time to recoup lost resources (time, energy, capital) shortens with increasing age. Yet, conclusive results regarding age related changes in decision making ability are few and far between, with the results drawn from the relatively few studies often yielding contradictory findings and conclusions.

Some decision making skills appear to decrease with age. Older adults make more mistakes when using decision rules (De Bruine et al., 2007), chose suboptimal options as the number of alternatives increases (Besedes et al., 2009), and utilize subpar choice strategies in order to reduce cognitive strain, at the cost of better odds of identifying the best option (Johnson, 1990). Older adults also tend to use less information when making decisions (Finucane et al., 2005; Johnson, 1990; Meyer, Russo & Talbot, 1995; Patrick, 1995). Research has suggested that although younger and older adults complete decision making tasks in similar amounts of time, younger adults tend to consider more options within that time and make higher quality decisions (Johnson, 1990). Other studies have indicated that some decision making skills may in fact increase with age. Older adults, for example, tend to perform better at resisting the sunk cost bias (ignoring prior investments when making decisions so that they reflect only future consequences) (De Bruin et al., 2007), and have been found to be more resistant to the influence of irrelevant options (Kim & Hasher, 2005) than their younger counterparts. Despite evidence on both sides, it is commonly agreed that age is associated with a general decline in decision making abilities (Thornton & Dumke, 2005).
Without reference to age, traditional theories have assumed that individuals integrate all available information to rationally determine the utility (efficacy) of various decision outcomes (Nash, 1950; Simon, 1954; von Neumann & Morgenstern, 1944), yet decades of research in psychology has revealed the frequency and consistency with which individuals systematically deviate from the tenants of rational decision making (Edwards, 1953; Kahneman & Tversky, 1979; Simon, 1957; Camerer & Thaler, 1995). Specifically, these studies showed that people tend to alter their choice preferences based on subtle changes to the language used in problem descriptions, a phenomenon known as the framing-error bias (Kahnemann & Tversky, 1979), allow past investments to impact future decisions and resource allocation, known as the sunk cost bias (Arkes & Blumer, 1985), and overestimate their ability to make accurate decisions, known as overconfidence (Camerer & Lovallo, 1999). Gauging the extent to which individuals fall prey to, or resist these and other decision fallacies is the commonly used method for measuring individual decision making competence. These specific decision fallacies will be explored in more detail momentarily.

Prescriptive decision models generally recognize four fundamental decision making skills: (a) belief assessment, which involves judging the likelihood of outcomes; (b) value assessment, which involves evaluating and prioritizing outcomes; (c) integration, which involves the ability to combine beliefs and values in order to make a choice; and (d) meta-cognition, which involves knowing the extent of one’s own cognitive abilities (DeBruin, Parker & Fischhoff, 2007; Edwards, 1954; Finucane & Lees, 2005; Raiffa, 1968). For each decision making skill, performance can be measured via: (a) accuracy, the extent to which the decision maker’s judgments match actuarial
estimates or (b) consistency, the extent to which the decision maker’s preferences do or do not contradict one another across different problem scenarios (Parker & Fischoff, 2005).

The Adult Decision Making Competence (ADMC) scale was designed to measure core decision making skills utilizing accuracy and consistency standards with a battery of tasks. In the original conceptualization of the ADMC, Parker and Fischhoff (2005) selected seven tasks to fit the theoretical categorization of the normative decision making skills mentioned above. For this dissertation, three of the original seven ADMC tasks were used including: resistance to framing, under/overconfidence and, resistance to sunk costs.

**Resistance to Framing.** Framing involves the way in which a question or problem is worded. Framing effects occur when the choice between two problems that are logically equivalent elicit different choices based on subtle changes to the nature of the language used to describe the problem (Tversky & Kahnemann, 1981).

Resistance to framing concerns the extent to which participants’ value assessments are affected by irrelevant variations in the descriptions of the problem. According to theories of rational choice, well-articulated values should be sensitive to relevant task changes and insensitive to irrelevant ones (Fischhoff, 1983). Yet, seminal research has suggested that humans regularly deviate from rational decision making approaches by showing inconsistent preferences for equivalent choices (Kahnemann & Tversky, 1979; Parker & Fishoff, 2005). For purposes of this study, the resistance to framing subscale was used to measure the decision making skill of *value assessment* by measuring participants’ performance according to the *consistency criterion* -- the extent
to which the participant was affected by irrelevant variations in the description of the various problems.

Framing can influence decision making in a number of different contexts via a variety of different types of frames (Levin, Schneider & Gaeth, 1998; Shamaskin, Mikels & Reed, 2010). In attribute framing tasks, a single attribute of a single object is described as either a positively framed proportion, or an equivalent negatively framed proportion (Sher & McKenzie, 2010). The participant’s task is to provide an evaluation of the object described. The typical phenomenon observed is referred to as a valence consistent shift (Levin et al., 1998), wherein positively framed objects are evaluated more favorably than negatively framed objects. For example, a commonly used attribute framing tasks typically reveals that participants rate beef described as being “75% lean” higher than beef that is described as being “25% fat” (Levin et al., 1998).

In risky-choice framing tasks, participants are given two options, which are typically gambles described in terms of proportions and probabilities of gains and losses, and forced to make a choice (Sher & McKenzie, 2010). Typically, one option is described as a sure thing, for which an immediate outcome is certain. The second option is a risky gamble, in which extreme good and bad values are assigned non-zero probabilities. Both the sure thing and the gamble are described as either gain outcomes and probabilities or equivalent loss outcomes and probabilities, and are equal in expected value allowing the researcher to observe patterns in risk attitude (Sher & McKenzie, 2010). Preferences for a sure thing suggest a risk-averse attitude, while preferences for a gamble indicate a risk-seeking attitude.
The classic example of a risky choice framing problem is the “Asian Disease Problem” (Tversky & Kahnemann, 1981) wherein individuals are asked to choose between two medical treatment programs for a disease outbreak expected to kill 600 people. The problem is as follows:

“Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. One possible program to combat the disease has been proposed. Assume that the exact scientific estimate of the consequences of this program is as follows:”

Participants are then presented with options: A: If this program is adopted, 200 people will be saved; and B: If this program is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

Later in the survey, participants are presented with the same problem with newly worded options: C: If this program is adopted, 400 people will die; and D: If this program is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

The typical phenomenon observed is that participants tend to prefer a sure thing when given choices A and B, but prefer to gamble when given options C and D, despite the fact the options A and C are equivalent, as are B and D. Kahnemann and Tversky (1979) concluded that participants tend to be risk-averse for gains, and risk seeking for losses.

With respect to age, research efforts have mainly targeted age differences in risky-choice framing tasks, with the results being largely unequivocal. For example, two studies found negligible age differences in the framing of hypothetical decisions.
(Mayhorn, Fisk & Whittle, 2002; Ronnlund, Karlsson, Laggnas, Larsson & Lindstrom, 2005), while another found an increase in framing susceptibility in older adults compared to younger adults (Kim, Goldstein, Hasher & Zacks, 2005). It is unclear how these results regarding the impact of age on risky-choice framing tasks may generalize to attribute-framing tasks. One possibility regarding the impact of age on attribute framing is that older adults express stronger preferences for positively framed information as a function of the positivity effect. The positivity effect is a phenomenon in which disproportionate preferences for negative information in youth shift toward disproportionate preferences for positive information in later life (Carstensen & Mikels, 2005).

**Resistance to Sunk Costs.** Rational decisions, by definition, should result in a net benefit to the decision maker. It is implied, therefore, that the rational decision maker will accrue some natural costs. Such costs may take the form of up-front investments of time, energy, or capital. The extent to which these costs have a bearing on future decision making is an important consideration. The sunk-cost fallacy is a frequently observed psychological phenomenon wherein the decision maker has a greater tendency to continue an endeavor once an investment in time, energy, or capital has been made (costs have been sunk) than he or she otherwise would in a similar situation in which an investment has not been made (Strough et al., 2012). A simple hypothetical example of this fallacy would be the tendency for an individual to spend more time watching a boring movie because he or she paid money to watch it, then he or she otherwise would have if the movie had been free. When making decisions about future investments, the rational, normatively correct decision is to base decisions exclusively on future
consequences, or perceived net-benefits, which do not consider investments made in the past (Arkes & Blumer, 1985; Parker & Fischoff, 2005; Ashraf, Berry & Shapiro, 2010).

It is thought that people honor sunk costs to avoid admitting that resources were wasted as a result of their decisions (Arkes & Blumer, 1985). In a classic sunk-cost experiment, Arkes and Blumer (1985) showed that patrons who paid full price ($15) for season tickets to a theater series attended more performances than did those who received a $2 or $7 discount. That is, the patrons who paid full price attended more performances as a result of having incurred a higher initial cost. In the original ADMC scale, the Resistance to Sunk Costs subscale was designed to measure the decision making skills of value assessment by measuring participants’ performance according to the accuracy criterion—the extent to which the participant makes decisions based on past investments (sunk-cost option) versus future consequences (normatively correct option).

As the sunk cost fallacy relates to age, research has generally suggested that older adults are more resistant to the sunk-cost bias (De Bruin, Parker & Fischhoff, 2007). One potential explanation for this observation lies in past research suggesting that older adults’ decisions reflect a more balanced view of gains and losses (Wood, Busemeyer, Klohling, Cox & Davis, 2005) and that losses do not loom larger than gains for older adults, as they do for younger adults (Mikels & Reed, 2009).

Under/Overconfidence. Under/over-confidence refers to the extent to which individuals’ beliefs, knowledge, or judgments correspond with the true state of affairs (Lichtenstein, Fischhoff & Phillips, 1982). Overconfidence is a reflection of the psychological observation that individuals are frequently overly certain in their judgments (Lichtenstein & Fischhoff, 1977). Under confidence is the opposite and less
observed phenomenon, wherein individuals are overly uncertain in their judgments. The tendency toward overconfidence is a highly prevalent decision making bias, which according to psychologist Scott Plous (1993) has likely played a role in several catastrophic world events, including the Challenger explosion and the radiation release from Chernobyl. Previous research has demonstrated that participants tend to report confidence levels up to 20% higher than their accuracy levels (Lichtenstein & Fischhoff, 1977; Lichtenstein, Fischhoff & Phillips, 1982).

Understanding one’s abilities is a critical decision making skill, as those with superfluous confidence may attempt tasks beyond his/her ability and ignore warning signs of bad decision making, while those with inadequate confidence may defer to others, hesitate, or distrust their ability to make good decisions (DeBruine, Parker, & Fischhoff, 2010). The under/overconfidence scale was used to measure the decision making skill of metacognitive awareness based on the accuracy criterion, which is the extent to which individuals’ confidence matches actual ability.

Studies examining age differences in under/overconfidence have yielded mixed results. For example, Forbes (2005) and Pliske and Mutter (1996) found a negative correlation between overconfidence and age. Perlmutter (1978) did not observe any relation between age and overconfidence, yet Crawford and Stankov (1996) observed a positive correlation between age and overconfidence. Further, research examining under/overconfidence and age has generally been limited to younger generations of older adults, excluding the oldest old (Dahl et al., 2009).

**Maximizing Tendency.** People make decisions by searching for strategies that provide good justification of their own choices (March, 1988). One of the most common
strategies involves an individual’s tendency towards maximizing versus satisficing. Maximizing is the tendency to seek the best possible option when making decisions and involves conducting an exhaustive search and consideration of the various possible options. It is therefore characterized by the utilization of significant resources (e.g. time, energy) in an effort to reach the best possible decision outcome (Simon, 1954). Satisficing is the tendency to use shortcuts when making decisions and to settle for a "good-enough" option that passes a "threshold of acceptability"(Simon, 1954; Diab et al., 2008). The ability to appropriately apply decision strategies and rules taps individuals’ integration capacity, that is, their ability to combine belief and value assessments coherently when making a decision. In theory, better integration processes should result in the selection and utilization of superior decision rules when faced with irrelevant changes in decision structure (Parker & Fischoff, 2005).

As maximizing tendency relates to age, past research has demonstrated that older adults tend to use less information when making decisions (Finucane et al., 2005; Johnson, 1990; Meyer, Russo & Talbot, 1995; Patrick, 1995) and report decision making behaviors more in line with the concept of satisficing (Tanius, 2009). The trend toward satisficing with increasing age is consistent with the theory of Selective Optimization with Compensation wherein older adults are thought to narrow goals, and optimize returns, finding new ways to compensate for their losses, and ultimately sustain high levels of function as a result of making the most of their resources (Baltes & Baltes, 1990). The extent to which age impacts older adults’ tendency to engage in decision styles consistent with maximizing versus satisficing will be explored and discussed in greater detail throughout this dissertation. Another compensation strategy thought to
benefit older decision makers involves the strategic use of others in the decision making process—collaborative decision making.

Preferences for Collaborative Decision Making

Collaborative decision making examines decision making as a social process, rather than as a solely individual endeavor (Strough & Margrett, 2002). In everyday life cognition is frequently a social activity (Berg, Meegan & Deviney, 1998; Meacham & Emont, 1989). People often include other people in their goals and strategies for solving everyday problems (Berg, Strough, Calderone, Sansone & Weir, 1998; Blanchard-Fields, Jahnke & Camp, 1995; Strough, Berg & Sansone, 1996). Preferences for collaborative decision making, then, concerns the extent to which people prefer to include others in their decision making process. Lifespan psychologists have suggested involving others in the decision process may serve a compensatory function over time, allowing older adults to maximize their cognitive resources (Margrett & Strough, 2002).

According to the theory of Selection and Optimization with Compensation (SOC) life span development is best conceptualized as a shifting balance between gains and losses (Baltes & Baltes, 1990). With age, the ratio between gains/losses gradually changes in favor of losses and away from gains, thus, older adults’ limited resources are allocated more toward maintenance rather than growth over time (Baltes & Baltes, 1990). SOC suggests that older adults actively select those activities in which they wish to optimize gains, while accepting the risk of failure or loss of function in those activities not selected (Baltes & Baltes, 1990). Older adults may then rely on compensation to maintain performance in their preferred activities by relying on various complementary resources.
In decision making research, it has been suggested that collaborating with others may provide a means for maintaining function despite age related declines in abilities, thereby helping to achieve balance in the gain/loss ratio (Berg at al., 2011; Strough & Margrett, 2002). Thus, collaboration may serve an adaptive function allowing older adults to compensate for cognitive declines that occur with increased age (Henkel & Rajaram, 2011; Meegan & Berg, 2002). Yet, findings from research on older adults’ preferences to collaborate when making decisions in various situations have been mixed. Some studies have suggested that older adults are more likely to prefer to use strategies that involve self-initiated actions (Berg et al., 1998), while others have found that older adults are more likely to include and rely on others to solve their problems compared to younger adults (Denney & Palmer, 1981). Still, another study suggested that there are no significant effects of age on preferences for collaborative decision making (Berg et al., 2003).

In the context of collaboration, Terror Management Theory (TMT) predicts that individuals made aware of their mortality will seek to enhance their self-esteem to shield themselves from the reality and thoughts of death. In doing so, individuals may attempt to strengthen social bonds with a preferred group (family, social network, etc.). Similarly, individuals experiencing terminal illness may experience a strong closeness with their families and supporters in an attempt to boost self-esteem (Little & Sayers, 2004). It may be that, in the presence of abnormally high psychological stress, decision makers find relief by relying on and collaborating with members of their social network. This area of research is not well understood to this point and will be explored in greater detail throughout this dissertation.
**Decision Context**

Decisions frequently involve and include multiple actors (e.g. self, spouse, friend, etc.), and can occur across many different contexts (home, work, doctor’s office, etc.) of various magnitudes (insignificant, extremely significant, etc.). For example, some decisions are fairly mundane, such as the deliberation over pancakes or waffles for Sunday morning breakfast. Decisions such as these tend to have little impact on the life of the decision maker and his or her immediate social circle. Others are more serious, and can have direct and immediate consequences to the decision maker’s life path, such as the decision to seek aggressive medical treatment, or to “wait-and-see” when making a medical decision.

Decision context, for the purpose of this dissertation, essentially refers to the situation in which the decision maker is operating. In this study, the decision maker is operating and deciding within the confines of the measurement instrument. The impact of context on problem perception and decision outcomes has not been thoroughly explored throughout the long history of decision making research (Rohrbaugh & Shanteau, 1999). Only in recent decades have decision making researchers acknowledged the significance of context on decision making (Payne, Bettman & Johnson, 1992), and begun to include contextual components in their decision making models. Despite this shift, there is little work related to context and decision making in the gerontological literature, and none to the author’s knowledge, that specifically examines how a cancer-specific life-threatening decision context impacts older adult’s decision making competence, and how having experienced cancer in the past may impact that relationship.
In a review of the literature on the impact of context on decision making processes and outcomes, Rohrbaugh and Shanteau (1999) suggested that the field of decision research would benefit from an approach that considers the influence of context on the decision process and examines the influence of additional variables such as experience and individual differences that influence decision processes. The current dissertation does just that, as it sought to explore the impact of a threatening versus a mundane decision context, self-esteem, and cancer experience on decision making competence, and preferences for collaborative decision making in a sample of older adults.

This dissertation is concerned with understanding the impact of mundane versus life-threatening contexts on older adults’ decision making competence, and individual preferences for collaborative decision making. The mundane decision context in this study is defined as those decisions likely to be encountered on a regular basis, as part of normal daily life. The life-threatening decision context is defined as decisions that are typically less frequently encountered (to the majority of individuals) and that have direct, and perhaps immediate, ramifications on length and quality of life. In this dissertation, the life-threatening decision context was operationally defined with cancer. Cancer was selected first because most older adults will be familiar with cancer, because it is an illness common in old age (78% of all diagnosed cancers are in the 55+ age demographic; 6.5 million cancer survivors over age 65 in the US) (SEER, 2006), and because it is generally perceived as being life threatening. The nature and direction of the impact of context on decision making competence and preferences for collaborative decision making will be explored in more detail throughout this dissertation.
Cancer Experience

There are several key factors, including past experiences, and the outcomes of those experiences, thought to heavily influence the decision making process and its potential outcomes (Juliusson, Karlsson & Gärling, 2005). Research has suggested that when a decision has a positive result, people are more likely to decide in a comparable way in the future when making a similar decision (Dietrich et al., 2010). Similarly, individuals are likely to avoid repeating decisions that resulted in undesirable (negative) outcomes when making similar decisions in the future (Sagi & Friedland, 2007). The extent to which the specific experience of a previous cancer diagnosis impacts decision making competence is largely unexplored at this time. This study sought to begin to understand the effect of previous cancer experience on older adults’ decision making competence and preferences or collaborative decision making in threatening and mundane contexts.

Additional Individual Difference Factors Related to Decision Making Competence

“Individual differences” is a broad term, covering any characteristic that differs between people, from decision style to cognitive ability to personality, and is therefore inherently complex in nature. Research has suggested that individual differences may moderate decision makers’ susceptibility to fall prey to various decision biases (Smith & Levin, 1996; Stanovich & West, 1999). For example, Lerner et al. (2003) found that leadership experience and increased need for cognition (active seeking-out of thinking activities) moderated individuals’ susceptibility to decision biases. The fundamental question of interest when studying individual differences addresses the extent of human behavior that can be attributed to the person versus the situation (Appelt et al., 2011).
Expanding on the current knowledge of the role of individual differences in decision making, this dissertation examined the influence of the following individual difference factors as predictors of decision making competence and of preferences for collaborative decision making: (a) future time perspective; (b) subjective appraisal of decision making competence; (c) psycho-social balance with respect to integrity versus despair; (d) risk tolerance; and (e) self-rated affect.

**Future Time Perspective.** Both time and perceptions of time are critical to decision making. Meaningful choices are simultaneously embedded in the context of time, and require the evaluation and consideration of future preferences and outcomes (Lockenhoff, 2011). In fact, the past, present and future impact the way in which individuals arrange and attribute meaning to experience (Zimbardo & Boyd, 1999). Future time perspective refers to the extent to which individuals focus on the future, rather than the present or past (Jacobs-Lawson & Hershey, 2005). Research has suggested that individuals with a heightened sense of future time perspective tend to associate present actions with increased probability of future outcomes (Fingermann & Perlmutter, 1995). Individuals with a time perspective oriented towards the present may not have this foresight and correspondingly fail to see the connection between current actions and future outcomes (Fingermann & Perlmutter, 1995). Either way, the extent to which individuals do or do not make this connection is likely to manifest itself in behavior (Hershey & Mowen, 2000).

The link between future time perspective and risk tolerance is clear in the literature, which suggests that individuals with heightened future time perspective tend to engage in less risky behavior than their counterparts lacking future time perspective.
Future time perspective may also impact the extent to which older adults fall prey to the sunk cost fallacy. Research has suggested that older adults demonstrate strong tendencies toward loss aversion (Soman, 2004) wherein attention to losses is diminished in order to maintain positive emotions in the present (Strough et al., 2012). Individuals with time perspectives oriented toward the present may, therefore, be more inclined to ignore losses (sunk costs) in order to maintain positive emotions in the present.

As time perspective relates to age, Socio-emotional Selectivity Theory (SST), has inspired a large field of research examining the implications of age-related limitations in time perspective for peoples thoughts, feelings, and interpersonal relations. According to SST, age-related changes in future time perspective and increasing awareness of the finite nature of life systematically affect goal priorities such that younger adults who perceive their future as being open ended are more likely to pursue those goals that optimize their future, while older adults are more likely to pursue goals focused on optimizing the present (Lockenhoff, 2011). Given such findings, the extent to which future time perspective impacts decision making competence and preferences for collaboration will be examined in this dissertation.

**Subjective appraisal of decision making competence.** Subjective appraisal of decision making competence refers to individuals’ perception of their own decision making competence in comparison to that of their peers. Research regarding the impact of subjective appraisal of problem solving ability has suggested that individuals who believe they have a good capacity for solving everyday problems were more likely to prefer to rely on their own resources for solving problems (Blanchard-Fields et al., 1997).
Research has also suggested that age may influence how individuals rate their own decision making competence. DeBruin et al. (2010) found that older adults rated themselves as overall worse decision makers than did younger adults when asked to compare their own decision making ability against that of others. Given the clear link between subjective appraisal, decision making, and age, this dissertation sought to understand how subjective appraisal may impact decision making competence and preferences for collaborative decision making in the wake of a life-threatening decision context.

**Psycho-social balance with respect to integrity versus despair.** Erikson’s Epigenetic Theory of psycho-social development asserts that life consists of a series of psychosocial crises that play an important role in the development of the individual. For Erikson, each of eight proposed developmental stages represents an encounter between the individual and the environment that needs to be successfully resolved in order for growth to occur (Erikson, 1974; Domino & Hannah, 1989). Each stage is conceptualized as being dependent on those that come before it, thus making the emergence of positive characteristics associated with early stages a prerequisite to the success of future stage conflicts (Erikson, 1968; Hannah et al., 1996), including the final stage of ego integrity versus despair.

Integrity versus despair has been described as the stage in which the individual either does or does not find some degree of purpose and coherence in life and accepts death as an unavoidable reality (Erikson, 1968). Erikson suggested that successful resolution of this crisis results in a feeling of peace with one’s self and the world and a positive review of one’s life. Failed resolution of this crisis results in despair, or a
general struggle to find purpose in life accompanied by a sense of denial regarding the reality of death. (Erikson, 1975).

Erikson’s Epigenetic Theory might offer a competing hypothesis regarding the relationship of the key variables of interest in the current dissertation research. Epigenetic theorists may suggest that the extent to which decision making competence is impacted by decision context will largely depend on the extent to which the decision maker has been successful or unsuccessful in the resolution of the integrity versus despair crisis. According to Erikson, the ego quality that emerges from a positive resolution is wisdom, while a negative resolution results in despair. This negative resolution may manifest itself as a fear of death, or a sense that life is too short (Erikson, 1982).

The extent to which individuals are successful in resolving integrity versus despair is likely to correlate with their future time perspective. For example, older adults who exhibit a negative resolution of this crisis would theoretically be more likely to demonstrate time perspectives oriented toward the future, as a reflection of their sense that life is too short, or their inability to grip the unavoidable reality of death (Erikson, 1982). On the other hand, individuals who have successfully resolved this crisis are likely to demonstrate time perspectives oriented toward the present, and correspondingly pursue goals aimed at optimizing emotional well-being in the present moment (Carstensen, 2006). Of interest is what impact these relationships may have on decision making competence. For example, individuals who have successfully resolved integrity versus despair, and focus on the present when pursuing goals may actually be more susceptible to sunk costs due to their inclination to pursue goals that optimize in the present, rather than the future. The impact of integrity versus despair as a predictor of
older adults’ decision making competence and preferences for collaborative decision making will be explored in more detail throughout this dissertation.

**Risk tolerance.** Risk tolerance refers to the amount of uncertainty a decision maker is willing to tolerate when making decisions. Risk tolerance is considered a psychological trait that is generally stable over time and across contexts, though not entirely concrete (Faff et al., 2004). For example, major positive and negative life events, such as a large loss of capital in the stock market, may impact individuals’ risk tolerance. Risk tolerance tends to be highly variable among individuals, yet somewhat predictable in its relationship to age. In general, older adults seek fewer physical and social risks compared to younger adults (Zuckerman, 1979), and tend to make more conservative decisions about major life events (Mather, 2006). The extent to which risk tolerance has an actual impact on real life decision outcomes is likely to depend largely on context and details of the decision. Given the documented link between risk tolerance and decision making competence, particularly as it relates to individuals’ tendencies to resist the framing-error bias, this dissertation sought to explore this relationship in more detail in the presence of life-threatening versus mundane decision contexts.

**Theoretical Foundation**

There is a gap in the existing understanding of how older adults’ decision making competence and preferences for collaboration are impacted by life-threatening decision contexts, self-esteem, previous cancer experience, and other individual differences. In describing the theoretical foundation for this research study, both Terror Management Theory, and the Conflict Model of Decision Making offer a justified and relatively novel approach for conceptualizing the relationships between key variables of interest.
Terror Management Theory. Terror Management Theory suggests that human beings are (a) pre-disposed to the desire to survive and (b) intelligent enough to realize that at some point death will inevitably occur for any number of reasons (Greenberg, 2011). On the surface this paradox would seem perplexing enough to fuel an endless supply of anxiety, yet the large majority of individuals are able to cope with such realities on a daily basis. According to Terror Management, human beings unconsciously and automatically manage this fear by reframing the world as being both permanent and meaningful, and by thinking of the self as a significant being (Solomon, Greenberg & Pyszczynski, 1991). Thus, anxieties associated with the fear of death are kept under control by the constant self-reminder that the world and self are both meaningful and stable (Solomon, Greenberg & Pyszczynski, 1991).

Specifically, Terror Management proposes that humans have created two defense mechanisms to counter thoughts of mortality: cultural worldview and self-esteem (Solomon, Greenberg & Pyszczynski, 1991). The cultural worldview consists of a set of beliefs/values about the nature of reality shared by groups that provides meaning, order, permanence, and stability to those who live up to standards set by the worldview. Self-esteem concerns an individual’s personal sense for how well he or she is living up to the standards of value put in place by the collective cultural worldview (Jonas et al., 2003). Cultural worldview validation enables the individual to identify with something larger and more enduring than the physical self, and may alleviate mortality terror by allowing the individual to perceive the world as a safe, stable place (Bassett, 2007). According to TMT, self-esteem involves feeling as though one is somehow different from the masses and therefore protected from death (Solomon, Greenberg & Pyszczynski, 1991). Self-
esteem enhancement is achieved and death anxiety buffered when individuals believe they have made a contribution to the world that will endure beyond their death (Bassett, 2007).

These two human defenses allow individuals to buffer themselves from the terror and corresponding anxieties associated with death. Utilizing such concepts, Terror Management purports two central hypotheses: (a) The anxiety-buffer hypothesis, and (b) the mortality-salience hypothesis. This dissertation was especially concerned with the former, which states that stably high or temporarily raised self-esteem acts as a buffer against death anxiety (Greenberg et al., 1992). This hypothesis has been supported by a number of empirical studies. For example, in an initial experiment (Greenberg et al., 1992) testing this hypothesis, participants were given false feedback about their personalities that was either extremely positive or mildly positive. After watching a neutral video that portrayed scenes of death, and completing a state-anxiety scale, it was discovered that those who had received mildly positive feedback exhibited much higher anxiety in response to the video than those who received extremely positive feedback. These findings were replicated in two follow-up studies utilizing anticipation of electric shock as the threatening impetus, and the bio-marker of skin conductance as the anxiety indicator. Both studies showed that boosting self-esteem eradicated the increased skin conductance typically encountered in response to electric shock threat (Harmon-Jones et al., 1997; Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004).

Human defenses may be challenged during an encounter with a person of serious physical illness (Hirschberger, Florian & Mikulincer, 2005). Research has suggested that encountering another’s illness evokes fear of experiencing a similar fate and may lead to
psychological distancing (Pszczyknsi et al., 1997). Thus, other individuals with physical illnesses may serve as potent mementos of one’s own fragile nature, thereby evoking death related fears and corresponding anxieties (Mosher & Burg, 2007).

With advancing age, older adults are subject to the increasing probability of death. This dissertation sought to foster understanding of the extent to which life threatening decision contexts impact older adults’ overall decision making competence and preferences for collaborative decision making. Though definitive answers are lacking, there is some evidence that older adults react differently to life threatening contexts and reminders of mortality than their younger counterparts. Maxfield and colleagues (2007) found that older adults responded more strongly (increased death-anxiety) to incidental exposure to death related words than to the classic mortality salience induction used throughout Terror Management experiments. Greenberg (2011) speculated that this result could be a function of older adults’ overexposure to blatant reminders of death in their daily life, resulting in an increased sensitivity to more subtle reminders.

Terror Management Theory, specifically research demonstrating the powerful impact of death related thought on individuals’ decisions and corresponding behaviors, served as the main impetus for asking questions about the impact of context on decision making competence in the current dissertation. Despite the empirical support for the main tenants of Terror Management Theory, it has yet to be applied to decision making models of older adulthood.

**Conflict Model of Decision Making.** Important decisions, such as whether to get married, quit a job, or undergo an experimental medical treatment, frequently give rise to intense intrapersonal conflict as we weigh those goals we wish to attain against the
threats we wish to avoid (Janis & Mann, 1977). There is ample evidence suggesting that the human decision maker is deleteriously affected by psychological stress outside of a certain range of normality. Historical analyses (Holsti, 1972), behavioral observations (Janis, 1982), and experimental evidence (Broadbent, 1971) offer countless examples of situations in which individuals under stress fail to adhere to the basic tenants of rational choice, opting instead for unnecessarily irrational and/or risky alternatives.

According to Janis and Mann’s Conflict Model of Decision Making, a vigilant approach to decision making under stress is the only approach that allows for rational decisions to be made (Janis & Mann, 1982). A vigilant process consists of, “the decision maker searching painstakingly through all relevant information, assimilating information in an unbiased manner and appraising alternatives carefully before making a choice” (Janis, 1982). Vigilant coping patterns lead to optimal performance when the decision maker is under moderate stress. Abnormal stress, however, opens the door for hyper-vigilance, which can cause a hasty, unorganized, and incomplete consideration of alternatives leading to suboptimal decision making, and post-decisional regret (Janis, 1982; Keinan, 1987). Thus, the conflict model provides a foundation for understanding how various intensities of experienced, or perceived stress, might impact decision making performance on various tasks.

In the context of the Terror Management research highlighting the association between thoughts of mortality, stress, and anxiety, the Conflict Model would suggest that thoughts of mortality have the potential to negatively impact decision making performance. Thus together, Terror Management Theory and the Conflict Model provide the theoretical underpinning for making hypotheses about the relationship between
context, stress and anxiety, and decision making competence. Yet, in spite of a large body of research and observation pertaining to the impact of stress on individual and group decision making, there exists little empirical data regarding the impact of stress and anxiety caused by thoughts of mortality on decision making and decision competence in the older adult population. The current dissertation will help to fill this void.

**Distinguishing Stress and Anxiety**

In daily life, the words ‘stress’ and ‘anxiety’ are often used interchangeably to describe a feeling of nervousness and/or frustration. In clinical settings these terms have different meanings for which different therapies are recommended based on the nature and magnitude of the condition. For the purposes of this dissertation, anxiety was conceptualized as the temporary feeling provoked when the individual is forced to deal with the realization that death will inevitably occur. Anxiety is essentially akin to fear, and becomes a disorder when that fear begins to impact daily functioning, or begins to emerge unexpectedly (Ahmed et al., 2011). The anxiety being discussed in this dissertation and in Terror Management literature in general, is likely to be temporary in nature, rather than chronic, and would not classify as a disorder.

Stress is a feeling that can be caused by any number of thoughts and/or events and which at acute levels, can actually serve adaptive purposes, helping the decision maker reach a beneficial decision (Janis & Mann, 1982; Lazalere & Jones, 2008). At heightened levels however, stress can have a harmful impact on decision making (Janis & Mann, 1982). In this study, it was reasoned that participants’ anxiety (aroused by reminders of deaths inevitability) would be caused by the nature of the life-threatening decision context, wherein participants were asked to make repeated decisions involving cancer as
a factor. It was reasoned that this anxiety would cause participants in the life-threatening decision context to experience heightened stress, beyond that which might be considered adaptive, thereby negatively affecting their decision making performance.

Summary of Literature Reviewed

Given the body of literature reviewed, there are a number of important points that collectively justify the need for the current study. First, Terror Management research suggests that the fear of death is a fundamental source of human conflict and anxiety (Greenberg et al., 1992) and that death related thought has a powerful impact on individuals’ decisions and corresponding behaviors (Harmon-Jones et al., 1997; Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004). Second, Conflict Theory proposes that decision makers are deleteriously affected by psychological stress outside of a certain range of normality (Janis & Mann, 1977). Third, the gerontological literature generally agrees that age is associated with a decline in decision making abilities (Thornton & Dumke, 2005). Finally, Greenberg (2011) drew the obvious conclusion that older adults are increasingly likely to face difficult decisions in which death is a factor.

Based on this research, there is need to investigate the extent to which older adults may be particularly disadvantaged when making decisions involving death. Despite this need, very little is known about how decision making competence among older adults is impacted by life threatening contexts. Specifically it is unknown how the experience of having made decisions in life-threatening contexts in the past, and how habits formed in previous non-threatening decisions, might impact decision making in life threatening contexts in the present. Further, despite the empirical support for the main tenants of Terror Management Theory, it has yet to be applied to decision making models of older
adulthood. The reviewed literature sets the stage for the research questions posed in this dissertation, wherein the effect of decision context, self-esteem, and cancer experience on older adults’ decision making competence will be examined.
Chapter Three: Specific Aims and Hypotheses

This study was designed to address four specific aims based on a critical application of the theoretical propositions of Terror Management Theory and the Conflict Model. The fundamental purpose of this dissertation was to better understand the effect of decision context, self-esteem, individual differences, and cancer experience on older adults’ decision making competence and preferences for collaborative decision making. All tables referenced in the text of this chapter can be found at the end of the chapter.

Specific Aim 1

The first aim was to examine the extent to which decision context and self-esteem impacted older adults’ decision making competence (see Table 3.1 for variables). To achieve this aim, three hypotheses were formulated.

Based on previous research suggesting that (a) fear of death is the fundamental source of human conflict and anxiety (Greenberg et al., 1992), (b) the human decision maker is deleteriously affected by psychological stress outside of a certain range of normality (Broadbent, 1971; Janis, 1982; Holsti, 1972), and (c) older adults are increasingly likely to face difficult decisions in which death is a factor (Greenberg, 2011), it was anticipated that older adults in the life-threatening condition would demonstrate overall poorer decision making competence than their counterparts in the mundane condition. That is, older adults in the life-threatening condition would be less resistant to framing errors, less resistant to the sunk-cost bias, and either over or under confident in their ability to make decisions.

Based on previous research findings from Terror Management Theory demonstrating the anxiety-buffer hypothesis, that high self-esteem allows individuals to function and make decisions with minimal anxiety and defensiveness (Greenberg, 2011),
it was hypothesized that older adults with higher self-esteem would demonstrate overall better decision making competence than their counterparts with lower self-esteem. That is, older adults with high self-esteem would be more resistant to framing errors, more resistant to the sunk cost bias, and neither under, or over confident in the evaluation of their decision making ability.

Based on research from Terror Management Theory implicating self-esteem as a vital buffer against death anxiety, it was hypothesized that self-esteem would alter the strength of the relationship between decision context and competence. It was expected that individuals with higher self-esteem would be affected less by the life threatening context than those individuals with lower self-esteem.

Specific Aim 2

The second aim of this research focused on how decision context and self-esteem impacted older adults’ preferences for collaborative decision making in three different hypothetical decision scenarios. The three scenarios included making a hypothetical medical treatment decision, making a decision to purchase a new automobile, and making a decision about retirement savings (see Table 3.2 for variables). To achieve this aim, the following three hypotheses were put forward.

Previous research has suggested that in buffering themselves from the anxieties associated with thoughts of mortality, individuals may attempt to strengthen social bonds with a preferred group (e.g., family or social network) (Baumeister & Leary, 1995; Greenberg, 2011). Thus, it was hypothesized that individuals in the life threatening condition would demonstrate stronger preferences for collaboration than participants in
the mundane condition, as a means of minimizing the stress associated with the threatening decision.

Research has suggested that elevated self-esteem allows individuals to function and make decisions with minimal anxiety and defensiveness (Greenberg, 2011). Furthermore, those who believe they have a good capacity for making decisions are likely to rely on their own resources for doing so (Blanchard-Fields et al., 1997), rather than involving others in the process. Thus, it was hypothesized that individuals with higher self-esteem would demonstrate overall weaker preferences for collaboration than their counterparts with lower self-esteem.

As in Specific Aim 1, it was anticipated that self-esteem would moderate the relationship between decision context and preferences for collaborative decision making. It was reasoned that self-esteem would alter the strength of the relationship between decision context and preferences for collaboration such that individuals with higher self-esteem would be affected less by the life threatening context than those individuals with lower self-esteem. Of particular interest here was the extent to which self-esteem was capable of acting as a buffer for death-related anxiety and the impact that buffering would have on preferences for collaboration.

**Specific Aim 3**

The third aim focused on understanding the impact of individual differences on older adults’ decision making competence. The individual differences of interest included (a) future time perspective, (b) subjective appraisal of decision making competence, (c) psycho-social balance with respect to integrity versus despair, and (d) risk tolerance (See Table 3.3). To achieve this aim, the following hypotheses were put forward.
It was expected that individuals with a time perspective oriented towards the future would demonstrate better decision making competence with respect to resisting the sunk cost bias, than individuals with time perspectives oriented toward the present, or past (Arkes & Blumer, 1985; Parker & Fischoff, 2005; Ashraf, Berry & Shapiro, 2010). Individuals with time perspectives oriented towards the future should theoretically be more inclined to focus on the future when making decisions, rather than focusing on resources expended in the past.

The successful or unsuccessful resolution of the final developmental crisis (integrity versus despair) as described by Erikson (1982) may be predictive of the extent to which participants are affected by the life threatening decision context. This hypothesis makes theoretical sense, but has yet to be empirically tested. Given this, it was hypothesized that decision context (as supported by the Terror Management literature), not ego integrity, would predict decision making competence.

The extent to which risk tolerance has an actual impact on decision outcomes is likely to depend largely on the context and details of the decision. Thus it was hypothesized that risk tolerance would not be a significant predictor of overall decision making competence. It was anticipated that individuals with a higher tolerance for risk would report decision making style consistent with satisficing, while individuals with a lower tolerance for risk would report decision making styles more consistent with maximizing. Research in the past has shown that maximizers tend to be (a) more rational, (b) less intuitive-avoiding reliance on feelings and instincts (Slovic, Finucane, Peters & McGregor, 2004), (c) more avoidant-postponing decisions to search for more information and consider the possibilities, and (d) less spontaneous- taking more time to
carefully decide, when making decisions compared to their satisficing counterparts (Schwartz et al., 2002).

Specific Aim 4

Analyses supporting the fourth and final aim of this research were exploratory in nature and sought to understand the impact of previous cancer experience (whether or not the participant had been diagnosed with cancer in the past) and decision context on decision making competence and collaborative decision making (See Table 3.4).

Based on past research demonstrating the impact of past experience on decision making processes and outcomes (Juliusson, Karlsson & Gärling, 2005), it was reasoned that individuals’ prior experience with a cancer diagnosis had the potential to be a significant factor, particularly for those individuals in the threatening condition making repeated cancer related decisions. However, the extent to which the specific experience of a previous cancer diagnosis impacts decision making competence is largely unexplored at this time. This study sought to begin to understand the effect of previous cancer experience on older adults’ decision making competence and preferences or collaborative decision making in threatening and mundane contexts.

Summary

The fundamental purpose of this dissertation was to better understand the effect of decision context, self-esteem, individual differences, and cancer experience on older adults’ decision making competence and preferences for collaborative decision making. Participants’ demographic characteristics including age, sex, education, race, ethnicity, marital status, and household income (included as control mechanisms) were also
expected to have an influence on the extent to which decision making competence and preferences for collaboration were impacted by decision context and self-esteem.

This study used an experimental design with random assignment into one of two conditions, life-threatening or mundane. In Chapter Four, the measurement instrument created and utilized to test the hypotheses are described in greater detail, as are the procedures used for collecting the study data. In Chapter Five, data analysis tools and techniques and the results of this study will be described. These results will be discussed in greater detail, in the context of the specific aims and expected outcomes, in Chapter Six.
Table 3.1

*Specific Aim 1: Effect of Decision Context and Self-esteem on Decision Making Competence in Older Adults*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Decision Context</td>
<td></td>
</tr>
<tr>
<td>Life-Threatening</td>
<td>Resistance to Framing</td>
</tr>
<tr>
<td>Mundane</td>
<td>Resistance to Sunk Costs</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Under/Overconfidence</td>
</tr>
<tr>
<td>Decision Context X Self-Esteem</td>
<td>Maximizing Tendency</td>
</tr>
</tbody>
</table>

Table 3.2

*Specific Aim 2: Effect of Decision Context and Self-esteem on Older Adults’ Preferences for Collaborative Decision Making*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Context</td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td>Life-Threatening</td>
<td>Medical Treatment Decision</td>
</tr>
<tr>
<td>Mundane</td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td>Product Purchase Decision</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td>Retirement Plan Decision</td>
<td></td>
</tr>
<tr>
<td>Decision Context X Self-Esteem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td></td>
<td>Retirement Plan Decision</td>
</tr>
</tbody>
</table>
Table 3.3

*Specific Aim 3: Effect of Individual Differences on Older Adults’ Decision Making Competence*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future Time Perspective</td>
<td>Resistance to Framing</td>
</tr>
<tr>
<td>Subjective Appraisal of Decision Making Competence</td>
<td>Resistance to Sunk Costs</td>
</tr>
<tr>
<td>Integrity vs. Despair</td>
<td>Under/Overconfidence</td>
</tr>
<tr>
<td>Risk Tolerance</td>
<td>Maximizing tendency</td>
</tr>
</tbody>
</table>

Table 3.4

*Specific Aim 4: Effect of Decision Context and Cancer Experience on Older Adults’ Decision Making Competence*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Context</td>
<td>Resistance to Framing</td>
</tr>
<tr>
<td>Life-Threatening</td>
<td>Resistance to Sunk Costs</td>
</tr>
<tr>
<td>Mundane</td>
<td>Under/Overconfidence</td>
</tr>
<tr>
<td>Cancer Experience</td>
<td>Maximizing Tendency</td>
</tr>
<tr>
<td>Previously Diagnosed</td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td>Not Previously Diagnosed</td>
<td><em>Medical Treatment Decision</em></td>
</tr>
<tr>
<td></td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td></td>
<td><em>Product Purchase Decision</em></td>
</tr>
<tr>
<td></td>
<td>Preferences for Collaborative Decision Making-</td>
</tr>
<tr>
<td></td>
<td><em>Retirement Plan Decision</em></td>
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</tbody>
</table>
Chapter Four: Research Design and Methodology

Design Overview

This work employed an experimental design with random assignment into one of two conditions (life-threatening or mundane). The participants were men and women aged 55-90 years, from the United States. Upon recruitment, consent, and condition assignment, participants were mailed the packet corresponding to their condition assignment (life-threatening or mundane). Participants completed measures designed to evaluate (a) self-esteem, (b) decision making competence, (c) preferences for collaborative decision making, (d) future time perspective, (e) self-rated affect, (f) risk tolerance, (g) subjective appraisal of decision making competence, (h) ego-integrity, and (i) previous experience with cancer, in addition to questions about their personal demographic information.

Participants

Study participants were recruited through online circulation of the study recruitment flyer (See Appendix A) and in-person solicitations at meetings and other events at community locations (senior centers, civic group centers, and churches, etc.). Online circulation included emailing the study flyer to local individuals and agencies working with, or on behalf of older adults. In person solicitations took place in a moderately-sized metropolitan area in central Kentucky. Adults between the ages of 55-90 were eligible to participate in the study.

Of the 340 surveys sent out, 210 were returned; of which 202 were usable yielding a usable response rate of 59%. Eight were returned blank or incomplete. Participants ranged from 55 to 90 years old ($M=68.15; SD=9.02$), and 32% were men.
and 68% were women. The majority of participants were married (63.4%) followed by widowed (17.4%) and divorced (12.4%). Participants were overwhelmingly Caucasian (93%) with a small African American (4%) representation. The median household income was $55-$75,000 (see Table 4.1 for full sample characteristics). Participants were not compensated for participating in this study. Participants were fully informed of the nature of the study and of their right to refuse participation, discontinue participation at any time, and skip any question they did not want to answer.

**Experimental Manipulation of Decision Making Competence**

The Adult Decision Making Competence scale (ADMC) (DeBruine et al., 2007) was used to measure decision making competence in two decision contexts: life-threatening and mundane. In order to adequately address the research hypotheses, and in absence of an existing decision making competence measure that could do so, the ADMC was modified in several ways. First, two distinct versions of the ADMC needed to be developed to represent the two decision contexts of interest to this dissertation, life threatening and mundane (see Appendix B). The items that made up the mundane ADMC were unchanged from those of the original ADMC, with the following exceptions: Items related to cancer and/or health treatment decision making were modified to occur in decision domains other than cancer or health. The threatening ADMC presented more of a challenge. Each item from the original ADMC was modified so that the problem posed, or decision being made, was linked to cancer. Further, a brief paragraph highlighting the link between age and cancer, and cancer’s potentially life-threatening nature, was created and inserted immediately prior to life-threatening ADMC items which read:
Since the risk of being diagnosed with cancer increases with age, most cases occur in adults who are middle aged or older. About 78% of all cancers are diagnosed in persons 55 years of age and older. Many of the following scenarios are related to making decisions about potentially life threatening cancers. You may not have personal experience with cancer, but maybe know a friend or relative who does. Regardless of your experiences, we are interested in your thoughts and the kinds of decisions you would make about cancer.

The theme of cancer was used because older adults are generally familiar with it, because it is an illness strongly correlated with age (78% of all diagnosed cancers are in the 55+ age demographic; 6.5 million cancer survivors over age 65 in the US) (SEER, 2006), and because it is generally perceived as being life threatening. Special care was taken to maintain the integrity of the items. Those items that were not able to be adapted were eliminated, and replaced with similar items created by the investigator in collaboration with study advisors.

Decision Making Competence. The Adult Decision Making Competence scale (ADMC) was utilized to measure older adults’ decision making competence (De Bruin, Parker & Fischhoff, 2007). The full ADMC contains 87 items split into 7 subscales, designed to measure whether individuals reach satisfactory decision outcomes. For purposes of the current study, only three of the seven subscales were used including a) resistance to framing, b) under/over confidence, and c) resistance to sunk costs. The ADMC was reduced to three of the original seven subscales to reflect those most relevant to the research questions according to a literature review, and to limit fatigue among the participants.
The ADMC was presented in the following sequence: (a) positive-item resistance to framing, (b) under/overconfidence, (c) resistance to sunk costs, (d) negative-item resistance to framing. This order is similar to that originally utilized by DeBruin and colleagues (2007) and is designed to maximize the amount of survey distance experienced by the participants between related tasks.

**Resistance to Framing.** The resistance to framing subscale assessed whether choices are affected by irrelevant variations in the description of the problem, specifically when framing the options in terms of gains or losses (Tversky & Kahneman, 1981; Fischhoff, 1983; Levin et al., 1998). The task posed to participants consists of both risky-choice and attribute framing problems. Risky-choice tasks present the decision maker with equal gain and loss versions of decision problems, including both a sure-thing option and a risky choice option (Fischhoff, 1983). The positive and negative frames appear in sets separate from one another, and with different item orders, as recommended by LeBoeuf & Shafir (2003) and adapted by Bruine de Bruine et al., (2007) in the original ADMC.

The resistance to risky-choice framing measure was reduced from 14 to 10 (5 positively framed/5 negatively framed) items for this dissertation. Items were then adapted to reflect a potentially life threatening decision context using cancer. The example below reflects how a question from the original ADMC was adapted to reflect the life threatening context. The words in parentheses detail the changes made.

“Imagine that recent evidence has shown that a pesticide (carcinogenic chemical) is threatening the lives of 1,200 animals (factory workers). The problem poses a choice between (a) saving 600 animals (workers) for sure and (b) a 75% chance
that 800 animals (workers) will be saved, and a 25% chance that no animals (workers) will be saved” (Adapted from: DeBruin, Parker & Fischoff, 2007).

The resistance to attribute framing measure was also reduced from 14 to 10 (5 negatively framed/5 positively framed) items for this dissertation. These items were also adapted to reflect the life threatening context. Again, the words in parentheses detail the changes made. A sample item reads as follows:

“Imagine that a woman (throat cancer patient) parked illegally (was caught smoking illegally in her hospital room). After talking to her, you believe that there is a 20% chance that she did not know she parked illegally (that smoking in the room was against the rules). With this in mind, how much of a fine do you believe this woman deserves (1 = minimum to 6 = maximum)?” (Adapted from: DeBruin, Parker & Fischoff, 2007).

The resistance to framing subscales (risky-choice and attribute framing) are scored using the same technique, by taking the mean absolute difference between ratings for the positive and negative versions of each item. More simply put, by measuring the difference between the participants’ choices on two separate problems which are identical in expected value, but framed in a different way. The following example will illustrate the scoring procedure: Assume that variables POS1 and NEG1 are the positively and negatively framed versions of the same risky choice framing problem encountered at different points in the survey by the participant. Upon encountering problem POS1 the participant is asked to choose on a 6-point scale between option A (1) and option B (6). Numbers in between (1) and (6) represent some level of indecision between options A and B. The questions are designed such that if the participant chooses options A for
POS1, he/she should also choose option A for NEG1, as they are the same problem with the same expected value. The absolute difference between the related items POS1 and NEG1 (|POS1 - NEG1|) quantifies the participant’s resistance to the framing error bias. If the participant resisted the frame, and chose option A for both POS1 and NEG1, he/she would score a zero (|1 - 1| = 0). This process is repeated for each resistance to framing item dyad (e.g. |POS1 - NEG1|) and the values are summed. Using this technique, separate scores can be attained for risky-choice framing, attribute framing, and overall resistance to framing. For each, lower scores indicate less susceptibility (more resistance) to framing error biases, and a perfect score would be zero.

**Resistance to Sunk Costs.** The resistance to sunk costs subscale assessed participants’ ability to ignore prior resource investments when making decisions across 10-items (Arkes & Blummer, 1985). According to normative decision models, unrecoverable expenditures from the past should be ignored when making decisions in the present, so that decisions only reflect future consequences (DeBruin, Parker & Fischhoff, 2007). The items (Baron et al., 1993) are answered on a scale ranging from (1) (most likely to choose option A), which indicates the sunk cost option, to (6) (most likely to choose option B), which represents the normatively correct option. In the following example, the mundane version of the problem is listed with the life threatening adaptations shown in parentheses:

You enjoy playing tennis (smoking cigars), but you really love bowling (drinking wine). You just became a member of the tennis club (cigar), and the bowling (wine of the month) club, at the same time. The membership to your tennis (cigar) club costs $200 per year and the membership to your bowling (wine) club...
costs $50 per year. During the first week of both memberships, you develop an elbow injury (potentially cancerous cyst in your stomach, making both smoking and drinking dangerous). It is painful to do both activities. Your doctor tells you that you will continue to experience the pain for about a year. Would you be more likely to play tennis (smoke a cigar) or bowling (drink wine) in the next 6 months? (Adapted from: DeBruin, Parker & Fischoff, 2007).

Resistance to sunk costs was scored by averaging the rating (1-6 scale) across the items [(SC1 + SC2 + SC3...SC10) / 10 = Resistance to sunk costs]. Scores range from a minimum of 10 to a maximum of 60. Higher scores reflect greater resistance to the sunk cost bias.

**Under/Overconfidence.** The Under/Overconfidence subscale assessed how well attuned participants were in terms of recognizing the accuracy of their own knowledge (Parker & Fischoff, 2005), serving as the key indicator of participants’ meta-cognitive awareness. Participants responded to a set of true/false statements, then indicated their confidence in the accuracy of their answer on a scale of 50 percent (just guessing) to 100 percent (absolutely sure). This measure was reduced from 34 items, to 16 items for the current dissertation as a means of shortening the overall length of the survey. For the life threatening context, new items were created based on NCI fact sheets: a collection of documents created by the National Cancer Institute addressing a variety of cancer-related topics. An example item from the original/mundane ADMC reads, “Thanksgiving day is always on the fourth Thursday of November.” An example item from the threatening ADMC reads: “Artificial sweeteners like aspartame are associated with increased cancer risk in the US.”
A total score is calculated by examining the difference between the participant’s overall confidence, averaged across all 16 items, and the percent of items correctly answered. Scores are attained using the following equation: \( \text{under/overconfidence} = 1 - |\text{mean confidence} - \text{percent correct across items}| \). Higher scores reflect a greater consistency between accuracy and confidence (i.e., better performance).

**Questionnaire**

Particular attention was given to the potential for order effects when constructing the questionnaire (Appendix C). The researcher and faculty advisors identified an order of measures as being the most appropriate, and the least likely to impact participant responses to the various scales. The questionnaire proceeded in the following order: self-esteem, future time perspective, integrity vs. despair, and risk tolerance. Following these initial measures, participants were presented with one of the two Adult Decision Making Competence (ADMC) measures (life threatening or mundane), based on the condition to which they were assigned. The ADMC measure was the only difference between the surveys. Equal numbers of questionnaires were compiled for each condition (mundane or potentially life threatening) and a random number generator was used to determine the order in which questionnaires were distributed. Upon completing the ADMC measure, participants completed the Positive and Negative Affect Schedule (PANAS), preferences for collaborative decision making scale, subjective appraisal of decision making competence item, cancer experience items, and demographic measures.

**Self-esteem.** The Rosenberg Self-esteem Scale is a well validated, global measure of self-esteem (Rosenberg, 1965). The scale is designed to measure individuals’ orientation toward themselves and provide a subjective evaluation of their overall worth.
or value. It has been used frequently in previous research on older adult populations. The scale consisted of 10 items, worded both positively and negatively, regarding individuals’ opinions of their own self-worth. Each item was answered on a 4-point Likert scale ranging from strongly agree (1) to strongly disagree (4). Items 3, 5, 8, 9 and 10 were written in reverse valence and required reverse coding. The scores range from 10-40. Higher scores indicate lower self-esteem, with 40 indicating the lowest possible self-esteem score. Reliability analysis based on the dissertation data revealed a Chronbach’s alpha of .760.

Future Time Perspective. Future time perspective was used to measure the extent to which individuals focus on the future, rather than the present or past (Hershey & Mowen, 2000). Participants rated the extent to which each of six statements described them on a 7-point likert scale response (1 = never like me; 7 = always like me). The scale is a general measure of the future time perspective personality dimension. Higher scores indicated a more future oriented time perspective, with 42 being the highest possible score, and 6 being the lowest. Responses for certain items (3, 4, 5, and 6) were reverse coded to ensure intra-individual consistency across items, and in order to ensure that respondents were paying attention to the questions they were reading. Reliability analysis revealed a Chronbach’s alpha of .683 based on the dissertation data.

Psycho Social Balance-Integrity versus Despair. Participants’ development with regard to integrity versus despair was measured with the Inventory of Psychosocial Balance (IPB) (Domino, 1989). The IPB was originally developed in the 1960’s as a means of operationalizing Erikson’s developmental stages into eight separable measurable constructs and corresponding scores. The complete IPB is a 120 item
inventory, consisting of 15 items per developmental stage and requiring participants to indicate agreement or disagreement for each item on a 4-point likert scale ranging from strongly agree (1) to strongly disagree (4). For the purposes of the current study, only those 15 items corresponding to the stage of ego-integrity and its corresponding crisis, integrity vs. despair, were utilized. An example item reads: “Having friends is important to me.” Lower scores indicate greater progress toward the resolution of the integrity vs. despair crisis. The lowest possible score is 15. The highest possible score is a 60. Reliability analysis revealed a Chronach’s alpha of .733 based on the data in this study.

**Risk Tolerance.** Risk tolerance was measured via a 10 item scale originally developed by Jacobs-Lawson (2003) for measuring risk tolerance for financial investing. The scale was modified to reflect a combination of financial and health attitudes toward risk. Each of the items uses a seven-point response format (1 = strongly agree, 7 = strongly disagree). An example item reads: “I prefer a sure thing over a gamble.” Scores range from a minimum of 10 to a maximum of 70. Higher scores indicate a greater tolerance for risk taking, while lower scores indicate greater risk aversion. Reliability analysis revealed a Chronbach’s alpha of .644 based on the data in this study.

**Maximizing Tendency.** The Maximizing Tendency Scale (Diab et al., 2008) was designed to assess how individuals approach decision situations. The scale provides information regarding individuals’ tendencies to maximize or satisfice when making decisions. Maximizing is the tendency to spend more resources in an effort to make the best possible decision (Simon, 1954). Satisficing is the tendency to use shortcuts when making decisions and to settle for a "good-enough" option that passes a "threshold of acceptability"(Simon, 1954; Diab et al., 2008). An example item from the scale is: “I am
someone who tends to expend maximum energy in order to make the best decision.” The scale consists of 11 items using a 5-point likert rating scale (1= strongly agree, to 5= strongly disagree). The lowest possible score is 11 while the highest possible score is 44. Lower scores indicate a tendency towards maximizing, while higher scores indicate a tendency towards satisficing.

**Self-Rated Affect.** The Positive and Negative Affect Schedule (PANAS) is a psychometric scale aimed at measuring both positive and negative affect. For example, the positive questions gauge the extent to which participants are attentive, interested, alert, enthusiastic, and inspired, while the negative questions gauge the extent to which participants report being upset, distressed, jittery, afraid, and guilty. The measure has been validated with adult populations and younger populations alike. The measure contains 10 items, each rated on a 5-point likert scale (1= never, to 5 = always), which demonstrate the regularity with which the participant generally experiences the indicated feeling. The scale divides into two subparts designed to measure negative affect (5-items) and positive affect (5-items). Each subscale is scored by taking the sum of its 5 items. The lowest possible score for negative/positive affect is 5, while the highest possible score is 25. Higher scores denote greater negative/positive affect. An example item reads: How often do you generally feel upset? The Negative Affect Schedule will help to gauge whether or not a negative affect was in fact created by the threatening decision context. For this reason, the PANAS immediately preceded the ADMC so as to get a measure of affect following the completion of the decision making competence items.
Preferences for Collaboration. Preferences for collaborative decision making were measured with respect to: (a) who, if anyone, the decision maker would prefer to collaborate with, (b) the extent to which the decision maker would prefer to involve the collaborator, and (c) the frequency with which the decision maker would prefer to collaborate. Three decision scenarios were presented including: making a medical treatment decision, purchasing a new vehicle, and adding to a retirement savings plan. This measure was created based on a modified version of a 3-item questionnaire utilized by Strough and colleagues (2002). These three scenarios were presented consistently across the sample, regardless of the condition assignment, so as to allow for a comparison of collaborative preferences.

For understanding which individuals the decision maker preferred to collaborate with, eight options were given and the participant was asked to check all that applied. To measure the extent to which participants would prefer to involve the collaborator, the participant rated each type of decision on a scale of 1 to 5 (1 = I prefer to make my own decision; 5 = I prefer someone else make the decision for me). Responses to this item were summed across the three decision scenarios with (3) being the lowest possible score, and (15) being the highest. Higher scores indicated participants’ preference for handing over decision control to the collaborator, while lower scores indicated participants’ preference for having complete control over the decision. To identify the frequency with which participants would prefer to collaborate, they rated each type of decision on a 5 point scale (1 = never prefer to collaborate; 5 = always prefer to collaborate). Responses were summed across the three decision scenarios with (3) being the lowest possible score, and (15) being the highest. Higher scores indicated participants’ preference for more
frequent collaboration, while lower scores indicated participants’ preference for less frequent collaboration.

**Subjective Appraisal of Decision Making Competence.** This subjective appraisal item is the same as that utilized by De Bruin and colleagues (2002) for measuring perceived decision making competence. Participants responded to the following question on a scale of 0-100 percent, “What percent of other people do you think are better decision makers than you?” Higher scores reflect more negative ratings of subjective appraisal of decision making competence.

**Demographics.** At the end of the questionnaire, participants were asked to provide demographic information including age, sex, education, race, ethnicity, marital status, health status, and household income. Participants were also asked who else currently lives with them, if they were capable of seeing well enough to read the newspaper, and if they were capable of hearing well enough to carry out a conversation in a crowded setting. These items were chosen to allow for comparison from similar studies (DeBruin et al., 2007), and because of the frequency with which they were cited and discussed as being significant to the relationships proposed in this study in the relevant literatures.

**Cancer Experience.** The final questions appearing on the questionnaire were designed to gauge participants’ experience with cancer. Participants responded to three separate questions designed to gauge the extent of their experience with cancer in their personal network. Specifically, participants were asked if they themselves, members of their immediate family, and members of their social network had ever been previously
diagnosed with cancer. Participants responding “yes” were asked to list the specific cancer diagnosis they or their family member/friend had received.

Procedure

IRB approved this dissertation in August of 2011. The study recruitment flyer used for soliciting participants in person and online was preapproved by both the Public Relations department at the University of Kentucky, and IRB, and was posted at various places throughout town, on campus at the University of Kentucky, and in those facilities that granted approval for soliciting participants. Individuals who agreed were given/sent a packet containing the study cover letter (See Appendix D), the questionnaire, and a postage paid return envelope. Participants were asked to mail the questionnaires back in a timely fashion, within two weeks being the stated goal. Because the research presented no more than a minimal risk to participants, and involved no procedures for which written consent is normally required, the completion and return of the survey packet served as participant consent.

Packets included a brief cover letter describing the study which reminded participants of the purpose of the study, and reassured them that they were under no obligation to participate, could refrain from answering any questions throughout the survey, and could choose to cease their participation at any point. Investigator contact information was made available on this letter. Half of the participants were randomly assigned to receive the mundane decision context survey. The other half of participants received the life threatening context survey.

Participants were explicitly asked to refrain from writing their name or address on the survey or the return envelope. Participants who agreed to participate online were sent
two emails, in 4 week intervals, reminding them to complete and return the survey. Those who volunteered to participate at in-person events and settings did not receive reminders to participate. Random number identifiers were used and were not linked to the participants’ identity in any way. Completed surveys were kept in a secure file cabinet. All participant contact information ascertained throughout the duration of the recruiting process (names and addresses) was destroyed once the packets had been mailed to the participants. Raw data will be kept for seven years, as is customary practice outlined by the American Psychological Association.

**Data Analysis**

Data entry began when questionnaires were returned complete. Data were entered and managed via SPSS v.18. Eight of the 210 surveys returned were not usable due to a sizeable amount of missing data and were excluded from the analyses. Prior to analyses, all data were checked for skew and found to be normally distributed. Analyses consisted of a series of Multiple Regression procedures for Specific Aims 1-4, with additional Analyses of Variance (ANOVA) procedures on Specific Aim 4. All alpha levels were set at .05.

Prior to conducting multiple regression analyses, all variables were centered to reduce multi-collinearity (Aiken & West, 1991). Two and three-way interaction variables were then computed by multiplying centered predictor variables forming the interaction of interest (e.g. Two-way- Age X Self-Esteem; Three-way-Age X Self-Esteem X Decision Context). In essence, two-way interactions represent the relationship between the predictor and the outcome variable, influenced by a third variable. Three-way interactions indicate a two-way interaction that differs across the levels of a third
variable. When significant interactions emerged, they were decomposed using simple effects analyses, which help detect the nature of the interaction. More specific details regarding the analysis procedure used to address individual aims and hypotheses will be addressed in the Chapter Five.
Table 4.1

**Sample Characteristics by Condition Assignment (N=202)**

<table>
<thead>
<tr>
<th></th>
<th>Mundane condition</th>
<th>Threatening condition</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.71 (SD=9.42)</td>
<td>67.59 (SD=8.62)</td>
<td>.64</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td>.73</td>
</tr>
<tr>
<td>Men</td>
<td>31 (31%)</td>
<td>33 (33%)</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>70 (69%)</td>
<td>67 (66%)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>.14</td>
</tr>
<tr>
<td>Caucasian</td>
<td>91 (90%)</td>
<td>97 (96%)</td>
<td></td>
</tr>
<tr>
<td>Afr. American</td>
<td>7 (7%)</td>
<td>2 (2%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1 (1%)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td>.56</td>
</tr>
<tr>
<td>≤ H.S. Diploma</td>
<td>8 (8%)</td>
<td>4 (4%)</td>
<td></td>
</tr>
<tr>
<td>Some college/Assoc.</td>
<td>20 (20%)</td>
<td>20 (20%)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>70 (70%)</td>
<td>74 (74%)</td>
<td></td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>2 (2%)</td>
<td>2 (2%)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td>.39</td>
</tr>
<tr>
<td>Single</td>
<td>3 (3%)</td>
<td>5 (5%)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>65 (65%)</td>
<td>63 (62%)</td>
<td></td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>11 (11%)</td>
<td>16 (16%)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>21 (21%)</td>
<td>15 (15%)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td>.66</td>
</tr>
<tr>
<td>Below $15,000</td>
<td>2 (2%)</td>
<td>4 (4%)</td>
<td></td>
</tr>
<tr>
<td>$15-$35,000</td>
<td>15 (15%)</td>
<td>16 (16%)</td>
<td></td>
</tr>
<tr>
<td>$35-$55,000</td>
<td>19 (19%)</td>
<td>22 (22%)</td>
<td></td>
</tr>
<tr>
<td>$55-$75,000</td>
<td>19 (19%)</td>
<td>12 (12%)</td>
<td></td>
</tr>
<tr>
<td>$75,000+</td>
<td>36 (36%)</td>
<td>39 (39%)</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
<td>.64</td>
</tr>
<tr>
<td>Poor/Fair</td>
<td>9 (9%)</td>
<td>12 (12%)</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>38 (38%)</td>
<td>41 (41%)</td>
<td></td>
</tr>
<tr>
<td>Very Good</td>
<td>39 (39%)</td>
<td>30 (30%)</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>14 (14%)</td>
<td>17 (17%)</td>
<td></td>
</tr>
<tr>
<td>Cancer diagnosis</td>
<td></td>
<td></td>
<td>.97</td>
</tr>
<tr>
<td>Yes</td>
<td>22 (22%)</td>
<td>22 (22%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>78 (78%)</td>
<td>78 (78%)</td>
<td></td>
</tr>
</tbody>
</table>

* indicates statistical significance at p ≤ .05; African-American (Afr. American); Associate’s Degree (Assoc.)
Table 4.2

Sample Characteristics by Previous Cancer Diagnosis (N=202)

<table>
<thead>
<tr>
<th></th>
<th>Previous Diagnosis</th>
<th>No Previous Diagnosis</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>71.75 (SD= 9.24)</td>
<td>67.17 (SD= 8.71)</td>
<td>.01*</td>
</tr>
<tr>
<td>Sex</td>
<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>12 (27%)</td>
<td>51 (33%)</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>32 (73%)</td>
<td>104 (67%)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>42 (96%)</td>
<td>145 (94%)</td>
<td></td>
</tr>
<tr>
<td>Afr. American</td>
<td>2 (4%)</td>
<td>6 (4%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0 (0%)</td>
<td>4 (2%)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ H.S. Diploma</td>
<td>4 (9%)</td>
<td>19 (12%)</td>
<td></td>
</tr>
<tr>
<td>Some college/Assoc.</td>
<td>18 (41%)</td>
<td>78 (50%)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>22 (50%)</td>
<td>54 (35%)</td>
<td></td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>0 (0%)</td>
<td>4 (3%)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>3 (7%)</td>
<td>5 (3%)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>26 (59%)</td>
<td>100 (65%)</td>
<td></td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>3 (7%)</td>
<td>24 (16%)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>11 (27%)</td>
<td>25 (16%)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below $15,000</td>
<td>2 (5%)</td>
<td>4 (3%)</td>
<td></td>
</tr>
<tr>
<td>$15-$35,000</td>
<td>4 (9%)</td>
<td>27 (17%)</td>
<td></td>
</tr>
<tr>
<td>$35-$55,000</td>
<td>9 (21%)</td>
<td>32 (21%)</td>
<td></td>
</tr>
<tr>
<td>$55-$75,000</td>
<td>7 (16%)</td>
<td>23 (15%)</td>
<td></td>
</tr>
<tr>
<td>$75,000+</td>
<td>19 (43%)</td>
<td>55 (36%)</td>
<td></td>
</tr>
<tr>
<td>Did not disclose</td>
<td>12 (6%)</td>
<td>16 (8%)</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor/Fair</td>
<td>2 (5%)</td>
<td>19 (13%)</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>25 (57%)</td>
<td>54 (35%)</td>
<td></td>
</tr>
<tr>
<td>Very Good</td>
<td>11 (25%)</td>
<td>56 (36%)</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>6 (13%)</td>
<td>25 (16%)</td>
<td></td>
</tr>
</tbody>
</table>

* indicates statistical significance at p ≤ .05; African-American (Afr. American); Associate’s Degree (Assoc.)
Chapter Five: Results

This chapter provides details about statistical analyses and the techniques used to address specific aims and hypotheses, and presents results of those analyses. Results for Specific Aims 1-4 are detailed below. All hypotheses were tested at a significance level of $p = .05$. Prior to conducting statistical analyses participants were coded according to the condition to which they had been randomly assigned. Participants who completed the life threatening context survey instrument were coded as one (1), while participants who completed the mundane context survey instrument were coded as two (2). All tables referenced in the text of this chapter can be found at the end of the chapter.

Specific Aim 1

Specific Aim 1 focused on the impact of decision context and self-esteem on older adults’ decision making competence. Specific Aim 1 was analyzed using a series of multiple regression models utilizing the four decision making competence measures (resistance to framing, resistance to sunk costs, under/overconfidence, and maximizing tendency) as the outcome variables. Decision context, age, self-esteem, and their 2-way and 3-way interactions were used as predictors.

Resistance to Framing. The multiple regression model analysis with resistance to framing as the outcome variable and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F (7, 174) = 1.11, p = .35, R^2 = .04$), as did all predictors (see Table 5.1.). These results did not support the hypotheses corresponding to Specific Aim 1.

Resistance to Sunk Costs. The multiple regression model analysis with resistance to sunk costs as the outcome variable and decision context, age, self-esteem,
and their interactions as predictors was significant \( F(7, 191) = 4.87, p = .01, R^2 = .15 \). This result was supportive of the hypothesis regarding the impact of decision context. Decision context was found to be a significant predictor of resistance to sunk costs such that participants in the mundane condition were more resistant to the sunk cost bias than those in the life-threatening condition (see Table 5.2).

**Under/Overconfidence.** The multiple regression model analysis with under/overconfidence as the outcome variable and decision context, age, self-esteem, and their interactions as predictors failed to reach significance \( F(7, 190) = .84, p = .55, R^2 = .03 \) as did all predictors (see Table 5.3). Therefore, hypotheses were not supported by the results.

**Maximizing Tendency.** The multiple regression model with maximizing tendency as the outcome variable and decision context, age, self-esteem, and their interactions as predictors failed to reach significance \( F(7, 190) = 1.64, p = .13, R^2 = .06 \) as did all predictors (see Table 5.4). Therefore, hypotheses were not supported by the results.

**Summary.** Results for Specific Aim 1 were mixed. Hypothesis one, that older adults in the life-threatening condition would demonstrate overall poorer decision making competence across subscales than their counterparts in the mundane condition, was partially supported by the result pertaining to sunk costs, but was not supported by the other three regression models. Hypothesis two, that individuals with higher self-esteem would demonstrate overall better decision making competence across subscales than their counterparts with lower self-esteem, was not supported by the data. Finally, hypothesis
three, that self-esteem would moderate the relationship between context and decision competence was not supported by these results.

**Specific Aim 2**

Specific Aim 2 focused on the impact of decision context and self-esteem on older adults’ preferences for collaborative decision making. Specific Aim 2 was analyzed using a series of multiple regression models, with two measures of preference for collaborative decision making as the outcome variables.

Participants’ preferences for collaborative decision making were measured in three different decision situations, which included making a medical treatment decision, purchasing a vehicle, and adding an annuity to a retirement savings fund. For each decision situation, participants’ preferences for collaboration were measured in two different ways. Participants indicated: (a) the amount of control they preferred and (b) the frequency with which they preferred to collaborate on decisions similar to those described in each of the three decision scenarios.

Thus for each of the three decision scenarios, two regression models were completed to test the impact of decision context and self-esteem on preferences for collaborative decision making. Each model used decision context, age, self-esteem, and their 2-way and 3-way interactions as predictors.

**Medical Treatment Decision.** The multiple regression model with participant reports of the amount of control they preferred to have over an experimental medical treatment decision as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F(6,191) = 1.62, p = .14, R^2 = .05$). Although age did technically emerge as a significant predictor, the overall model
was insignificant therefore voiding this result of value. No other predictors reached significance (see Table 5.5). This result was not supportive of the hypotheses proposed in Specific Aim 2.

The multiple regression model with participant reports of the frequency with which they preferred to collaborate on an experimental medical treatment decision as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors did not reach significance ($F (6, 183) = .65, p = .69, R^2 = .02$). All predictors also failed to reach significance (see Table 5.5). Therefore, hypotheses were not supported by the results.

**Automotive Purchase Decision.** The multiple regression model analysis with participant reports of the amount of control they preferred to have over an automotive purchasing decision as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F (6, 192) = .82, p = .56, R^2 = .03$). All predictors failed to achieve significance as well (see Table 5.6). Thus, this result was not supportive of the hypotheses pertaining to Specific Aim 2.

The multiple regression model with participant reports of the frequency with which they preferred to collaborate on an automotive purchasing decision as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F (6, 185) = .19, p = .98, R^2 = .01$). All predictors also failed to achieve significance (see Table 5.6). Therefore, hypotheses were not supported by the results.

**Retirement Plan Decision.** The multiple regression model with participant reports of the amount of control they preferred to have over adding to their retirement
plan as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F (6,191) = .41, p = .87, R^2 = .01$), as did all predictors (see Table 5.7). This result was not, therefore, supportive of the hypotheses corresponding with Specific Aim 2.

The multiple regression model analysis with participant reports of the frequency with which they preferred to collaborate with others when making the decision to add to their retirement plan as the outcome variable, and decision context, age, self-esteem, and their interactions as predictors failed to reach significance ($F (6,186) = .46, p = .84, R^2 = .02$). All predictors failed to achieve significance as well (see Table 5.7). Thus, this result was not supportive of the hypotheses put forward in Specific Aim 2.

**Summary.** Hypotheses pertaining to Specific Aim 2 were not supported. Hypothesis 1, that individuals in the life-threatening condition would demonstrate stronger preferences for collaboration than participants in the mundane condition, as a means of minimizing the stress associated with the threatening decision, was not supported by the results. Hypothesis 2, that individuals with higher self-esteem would demonstrate weaker preferences for collaboration than their counterparts with lower self-esteem, was not supported by the results. Finally, Hypothesis 3, that self-esteem would moderate the relationship between decision context and preferences for collaborative decision making was not supported by the results.

**Specific Aim 3**

The third aim of this dissertation sought further understanding regarding the impact of decision context and individual difference factors on older adults’ decision making competence. Specific Aim 3 was analyzed using a series of multiple regression
models that used the four decision making competence measures (resistance to framing, resistance to sunk costs, under/overconfidence, and maximizing tendency) as the outcome variables. Individual difference factor variables: age, sex, self-esteem, future time perspective, integrity versus despair (ego-integrity), risk tolerance, and subjective appraisal of decision making competence, were used as predictors. Analyses were conducted separately for the threatening and mundane conditions.

**Resistance to Framing.** The multiple regression model with resistance to framing as the outcome variable and age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, and subjective appraisal of decision making competence as predictors was found to be marginally significant ($F(7, 89) = 1.85, p = .09, R^2 = .13$) in the mundane model. Both future time perspective ($p = .05$) and subjective appraisal of decision making competence ($p = .03$) reached significance as predictors. Those who rated themselves as being worse decision makers than their peers were more resistant to framing. Similarly, participants with time perspectives oriented towards the future were more resistant to the framing error bias (see Table 5.8). The threatening model failed to reach significance ($F(7, 82) = 1.22, p = .30, R^2 = .09$) and all predictors failed to achieve significance (see Table 5.8).

**Resistance to Sunk Costs.** A multiple regression model with resistance to sunk costs as the outcome variable and age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, and subjective appraisal of decision making competence as predictors found no significant results. In both the mundane condition ($F(7, 89) = 1.85, p = .82, R^2 = .13$) and the threatening condition ($F(7, 90) = .39, p = .90, R^2 = .03$) the model failed to reach significance as did all of the predictors (see Table 5.9). These
results were not supportive of the hypothesis that individuals with a time perspective oriented more towards the future would demonstrate better resistance to the sunk cost bias than individuals with a time perspective oriented towards the past, or present.

**Under/Overconfidence.** A multiple regression model with under/overconfidence as the outcome variable and age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, and subjective appraisal of decision making competence as predictors yielded no significant results. In both the mundane condition \( F(7, 89) = 1.85, p = .79, R^2 = .12 \) and the threatening condition \( F(7, 90) = .32, p = .32, R^2 = .08 \) the model failed to reach significance as did all of the predictors (see Table 5.10).

**Maximizing Tendency.** A multiple regression model with maximizing tendency as the outcome variable and age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, and subjective appraisal of decision making competence as predictors yielded several significant results. In the mundane condition, the model was significant \( F(7, 92) = 7.03, p = .01, R^2 = .34 \). Ego-integrity \( p = .05 \), risk tolerance \( p = .01 \) and subjective appraisal of decision making competence \( p = .02 \) were significant, with age \( p = .06 \) reaching marginal significance (see Table 5.11). Individuals demonstrating more psychosocial balance with respect to integrity versus despair, those who rated themselves as worse decision makers than their peers, and older-older adults were more likely to embrace a decision making style consistent with maximizing. As hypothesized, those with a higher tolerance for risk were more likely to embrace a decision making style consistent with satisficing, as were younger-older adults.

The threatening condition model also was significant \( F(7, 89) = 2.49, p = .02, R^2 = .16 \), with risk tolerance \( p = .03 \) attaining significance and ego-integrity \( p = .06 \)
attaining marginal significance. As hypothesized, those with greater risk tolerance were more likely to embrace a satisficing decision making style (see Table 5.11). Furthermore, participants demonstrating more psychosocial balance with respect to integrity versus despair were more likely to embrace a maximizing decision making style.

**Summary.** Hypotheses pertaining to Specific Aim 3 were mixed. The first hypothesis, that individuals with a future time perspective oriented toward the future would demonstrate better overall decision making competence specifically with respect to being more resistant to the sunk cost bias, was not supported. Future time perspective did, however, have a significant impact on participants’ resistance to the framing error bias. Specifically, participants with time horizons oriented toward the future were significantly more resistant to framing errors than individuals with time perspective oriented more towards the present or past.

Hypothesis two, that ego integrity would not predict overall decision making competence was confirmed. Ego integrity did not predict decision making competence, but did impact older adults’ decision making style such that participants demonstrating more psychosocial balance with respect to integrity versus despair were more likely to embrace a maximizing decision making style in both conditions.

Hypothesis three, that risk tolerance would not be a significant predictor of decision making competence was confirmed. Hypothesis four, that individuals with a higher tolerance for risk would embrace a decision making style consistent with satisficing, and those with a lower tolerance for risk would embrace a decision making style consistent with maximizing was supported. Risk tolerance predicted decision
making style across both conditions such that individuals with higher risk tolerance were more likely to report a satisficing decision making style.

**Specific Aim 4**

Specific Aim 4 was exploratory in nature and sought to understand the impact of previous cancer experience (whether or not the participant had been diagnosed with cancer in the past) and decision context on the key dependent variables examined in the first three aims—decision making competence and collaborative decision making.

To test the impact of decision context and cancer experience on decision making competence, and preferences for collaborative decision making, a series of 2 (decision context) x 2 (cancer experience) analyses of variance (ANOVA’s) were used. The dependent variables were either the: a.) decision making competence constructs (resistance to framing, resistance to sunk costs, under/over confidence, maximizing tendency) or the, b.) preferences for collaborative decision making measures, depending on the relationship being tested.

To assess the impact of cancer experience on additional factors related to decision making competence, a series of multiple regression models were conducted using age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, and subjective appraisal of decision making competence as predictors.

**The Effect of Cancer Experience on Decision Making Competence.** Specific Aim 1 examined the impact of context and self-esteem on decision making competence, but offered very little explanation regarding the relationship between decision context and decision competence. In search of further understanding, analyses were conducted that considered participants’ past experience with cancer diagnosis (whether or not they...
had been diagnosed with cancer). A series of ANOVA’s were conducted to examine the impact of decision context and cancer experience on older adults’ decision making competence.

**Resistance to Framing.** The 2 (context) x 2 (cancer experience) ANOVA utilizing resistance to framing as the dependent variable, revealed a marginally significant interaction between context and cancer experience ($F(1,183) = 3.47, p = .06$; see Figure 5.1). Simple effects analyses revealed that, of those individuals who had been diagnosed with cancer in the past, those in the threatening condition ($F(1,179) = 4.24, p = .04$) were more susceptible (less resistant) to framing than those in the mundane condition ($F(1,179) = .03, p = .86$). No significant main effects were found for context ($F(1,183) = 2.85, p = .09$) or cancer experience ($F(1,183) = .64, p = .42$) (See Table 5.12).

As was previously described, resistance to framing takes into account participants’ susceptibility to framing effects for two distinct categories of framing: risky-choice framing and attribute framing. To better understand the relationship between resistance to framing, decision context, and cancer experience, the resistance to framing variable was broken down and analyzed using these core constructs, resistance to risky choice framing and resistance to attribute framing, as dependent variables.

The 2 (context) x 2 (cancer experience) ANOVA utilizing resistance to risky-choice framing as the dependent variable, revealed a significant main effect for cancer experience ($F(1,192) = 5.19, p = .02$). This result suggested that participants with a previous diagnosis of cancer were less resistant (see Table 5.12) to risky-choice framing effects than their non-cancer counterparts. There was no significant main effect for
context ($F(1,192) = 3.52, p = .06$). No significant interaction between cancer experience and context was found ($F(1,192) = .32, p = .57$).

The 2 (context) x 2 (cancer experience) ANOVA utilizing resistance to attribute-framing as the dependent variable revealed a significant interaction between context and cancer experience ($F(1,189) = 4.14, p = .04$; see Figure 5.2). Simple effects analysis revealed that, among those individuals who had not been diagnosed with cancer in the past, those in the threatening condition were significantly more resistant to framing ($F(1,185) = 5.83, p = .02$) than those in the mundane condition (Table 5.12). There were no significant main effects for context ($F(1,189) = .08, p = .06$) or cancer experience ($F(1,189) = .74, p = .39$).

**Resistance to Sunk Costs.** The 2 (context) x 2 (cancer experience) ANOVA utilizing resistance to sunk costs as the dependent variable revealed a significant main effect for context ($F(1,199) = 16.99, p = .01$). This result suggests that individuals in the mundane condition were significantly more resistant (see Table 5.12) to the sunk cost bias (i.e. less likely to allow past investments to affect present and/or future decisions) than those in the threatening condition. A marginally significant main effect for cancer experience ($F(1,183) = 3.48, p = .06$) revealed that individuals with a previous cancer diagnosis were more resistant to the sunk cost bias than those lacking a prior cancer diagnosis. A significant interaction was not found for context and cancer experience ($F(1,199) = .39, p = .53$).

**Under/overconfidence.** The 2 (context) x 2 (cancer experience) ANOVA utilizing under/overconfidence as the dependent variable revealed no significant main effects for cancer experience ($F(1,198) = .02, p = .89$) or context ($F(1,198) = .44, p = .
There was not a significant interaction between cancer experience and context ($F(1,198) = .01, p = .92$). Under/overconfidence did not significantly vary as a function of context or previous experience with cancer (Table 5.12).

The under/over confidence variable represents the combination of two distinct constructs: confidence and accuracy. To further understand the relationship between under/overconfidence, decision context, and cancer experience, these variables (confidence and accuracy) were tested as dependent variables.

The 2 (context) x 2 (cancer experience) ANOVA with confidence as the dependent variable revealed a significant main effect of context ($F(1,198) = 5.01, p = .03$) suggesting that individuals in the mundane condition were significantly more confident (Table 5.12) in their choices than those individuals in the threatening condition. There was not a significant main effect for cancer experience ($F(1,198) = 1.51, p = .22$) or a significant interaction between cancer experience and context ($F(1,198) = .03, p = .85$).

The 2 (context) x 2 (cancer experience) ANOVA with accuracy as the dependent variable revealed a marginally significant interaction between context and cancer experience ($F(1,198) = 3.66, p = .06$, see Figure 5.3). Simple effects analysis revealed two significant effects. For those who had been previously diagnosed with cancer, individuals in the threatening condition were significantly less accurate in their decision making than those in the mundane condition ($F(1,194) = 21.61, p = .01$). Similarly, among those who had not been diagnosed with cancer in the past, individuals in the threatening condition were significantly less accurate than those in the mundane
condition \((F(1,198) = 21.52, p = .01)\) (Table 5.12). No significant main effect for cancer experience was found \((F(1,198) = .52, p = .47)\).

**Maximizing Tendency.** The 2 (context) x 2 (cancer experience) ANOVA utilizing maximizing tendency as the dependent variable, revealed no significant main effects for cancer experience \((F(1,198) = 1.03, p = .31)\) or context \((F(1,198) = .16, p = .69)\). There was no significant interaction between cancer experience and context \((F(1,198) = .49, p = .48)\). Participants did not differ in their tendency to maximize or satisfice as a function of context or previous experience with cancer (Table 5.12).

**Subjective Appraisal of Decision Making Competence.** The 2 (context) x 2 (cancer experience) analysis of variance, utilizing subjective appraisal of decision making competence as the dependent variable, revealed a significant interaction between context and cancer experience \((F(1,198) = 6.24, p = .013, \text{see Figure 5.4})\). Simple effects analysis revealed a marginally significant effect of context such that among those individuals with previous cancer experience, those in the mundane condition rated themselves more positively as decision makers than those in the threatening condition \((F(1,194) = 3.77, p = .06)\). There were no significant main effects for cancer experience \((F(1,198) = .69, p = .41)\) or context \((F(1,198) = .86, p = .36)\) (see table 5.12).

**The Effect of Cancer Experience on Preferences for Collaboration.** Specific Aim Two examined the impact of context and self-esteem on preferences for collaborative decision making. As these initial analyses offered little explanation regarding the relationship between decision context and preferences for collaborative decision making, follow-up analyses were conducted in order to account for participants’ past experience with cancer diagnosis (whether or not they had been diagnosed with
A series of ANOVA’s were conducted to allow for the examination of the impact of decision context and cancer experience on preferences for collaborative decision making variables across three hypothetical decision scenarios. For each scenario, two ANOVA’s were performed. One in which participant reports of the amount of control they preferred to have over the decision scenario was the dependent variable, and one in which participants reports of the frequency with which they preferred to collaborate on the decision scenario was the dependent variable.

**Medical Treatment Decision.** For the medical treatment decision scenario, participants reported preference for the amount of control they preferred to have over an experimental medical treatment decision was the dependent variable. The 2 (context) x 2 (cancer experience) ANOVA revealed no significant main effects for cancer experience ($F (1,198) = 1.52, p = .22$) or context ($F (1,198) = .11, p = .74$). The interaction between context and cancer experience ($F (1,198) = .13, p = .72$) was not significant (see Table 5.13 for means and standard deviations).

Using participant reports of the frequency with which they preferred to collaborate on an experimental medical treatment decision as the dependent variable, the 2 (context) x 2 (cancer experience) ANOVA again revealed no significant main effects for cancer experience ($F (1,190) = 1.92, p = .17$) or context ($F (1,190) = .36, p = .55$). A significant interaction was not found between context and cancer experience ($F (1,190) = .48, p = .49$; see Table 5.13 for means and standard deviations).

**Automotive Purchase Decision.** For the automotive purchasing decision scenario, participants reported preference for the amount of control they preferred to have over an automotive purchasing decision was the dependent variable. The 2 (context) x 2 (cancer experience) ANOVA revealed no significant main effects for cancer experience ($F (1,190) = 1.92, p = .17$) or context ($F (1,190) = .36, p = .55$). A significant interaction was not found between context and cancer experience ($F (1,190) = .48, p = .49$; see Table 5.13 for means and standard deviations).
experience) ANOVA revealed no significant main effects for cancer experience ($F(1,199) = .49, p = .48$) or context ($F(1,199) = .06, p = .81$). No significant interaction was found between context and cancer experience ($F(1,199) = .91, p = .34$) (see Table 5.13 for means and standard deviations).

Utilizing participants reports of the frequency with which they preferred to collaborate when making the decision to purchase a new automobile as the dependent variable, the 2 (context) x 2 (cancer experience) ANOVA again revealed no significant main effects for cancer experience ($F(1,192) = 1.71, p = .19$) or context ($F(1,192) = .09, p = .76$). No significant interaction was found between context and cancer experience ($F(1,192) = .01, p = .95$) (see Table 5.13 for means and standard deviations).

Retirement Plan Decision. For the retirement plan decision scenario, participants reported preference for control over a retirement plan decision was the dependent variable. The 2 (context) x 2 (cancer experience) ANOVA revealed a significant main effect of cancer experience ($F(1,198) = 3.95, p = .04$). This result suggests that individuals with a previous cancer diagnosis prefer significantly more collaboration on decisions involving their retirement plans. The main effect for context ($F(1,198) = .09, p = .76$) and the interaction between context and previous cancer experience ($F(1,198) = .01, p = .95$; see Table 5.13 for means and standard deviations) were not significant.

Using participant reports of the frequency with which they preferred to collaborate with others when making the decision to add to their retirement plan as the dependent variable, the 2 (context) x 2 (cancer experience) ANOVA again revealed no significant main effects for cancer experience $F(1,193) = .82, p = .37$ or context ($F$
The interaction between context and cancer experience ($F(1, 193) = .04, p = .84$; see Table 5.13 for means and standard deviations) was not significant.

The Effect of Cancer Experience on Additional Factors Related to Decision Making Competence. Specific Aim 3 examined the impact of decision context and individual difference factors on older adults’ decision making competence. Follow-up analyses were conducted taking into consideration participants’ past experience with cancer diagnosis (whether or not they had been diagnosed with cancer). These analyses used a series of multiple regression models with decision making competence variables (resistance to framing, resistance to sunk costs, under/over confidence, maximizing tendency) as the outcome variables. Prior to conducting these analyses, the data file was split to allow for separate but identical analyses of the data for the threatening and mundane conditions.

Resistance to Framing. For resistance to framing, a series of regressions were conducted using resistance to framing as the outcome variable and age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience and subjective appraisal of decision making competence as predictor variables. Results failed to reach significance in the mundane ($F(8, 82) = 1.72, p = .10, R^2 = .14$) and threatening ($F(8, 90) = 1.26, p = .68, R^2 = .11$) models. No predictors reached significance (see Table 5.14).

For resistance to risky-choice framing, a series of regressions with age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience and subjective appraisal of decision making competence as predictor variables were used. The mundane condition model was marginally significant ($F(8, 96) = 1.85, p = .08, R^2 = .14$). Future time perspective ($p = .01$) was a significant predictor of resistance to risky-
choice framing (see Table 5.15.) such that individuals with time perspectives oriented toward the present were less resistant to risky-choice framing errors than those with time perspectives oriented toward the future. The threatening condition model failed to reach significance \( F(8, 93) = 1.64, p = .13, R^2 = .13 \).

For resistance to attribute-choice framing, a series of regressions with age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience, and subjective appraisal of decision making competence as predictor variables were used. The mundane condition model was marginally significant \( F(8, 95) = 1.99, p = .06, R^2 = .16 \). Age \( (p = .04) \) emerged as the only statistically significant predictor, with younger-older adults demonstrating more resistance to the attribute-choice framing error bias (see Table 5.16). Previous cancer diagnosis emerged as a marginally significant predictor \( (p = .06) \) with those individuals having been diagnosed in the past demonstrating more resistance to attribute-choice framing error biases. The threatening condition model was not significant \( F(8, 91) = .92, p = .08, R^2 = .08 \); see Table 5.16).

**Resistance to Sunk Costs.** To examine the impact of cancer experience and additional factors on resistance to sunk costs a series of regressions were conducted using age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience, and subjective appraisal of decision making competence as predictor variables. In the mundane condition, the model was not significant \( F(8, 98) = .79, p = .61, R^2 = .07 \). The threatening condition model did reach significance \( F(8, 89) = 1.22, p = .05, R^2 = .09 \) with ego-integrity \( (p = .02) \) emerging as a significant predictor, suggesting that those who had made more developmental progress with respect to the
integrity versus despair crisis resolution were more resistant to the sunk cost fallacy (see Table 5.17).

**Under/Overconfidence.** For under/overconfidence a series regressions were conducted using age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience, and subjective appraisal of decision making competence as predictor variables. In the mundane condition, the model was not significant ($F (8, 97) = 1.02, p = .43, R^2 = .02$). In the threatening condition, the model also failed to reach significance ($F (8, 97) = .78, p = .62, R^2 = .07$; see Table 5.18).

**Maximizing Tendency.** For maximizing tendency, a series of regressions were conducted using age, sex, self-esteem, future time perspective, ego-integrity, risk tolerance, cancer experience, and subjective appraisal of decision making competence as predictor variables. In the mundane condition, the model was significant ($F (7, 98) = 6.48, p = .01, R^2 = .33$), with both age ($p = .04$) and risk tolerance ($p = .01$) emerging as significant predictors (see Table 5.19). Younger-older adults were more likely to demonstrate decision making styles in line with satisficing, as were those individuals with higher tolerance for risk. In the threatening condition, the model was also significant ($F (7, 97) = 2.65, p = .02, R^2 = .17$), with risk tolerance ($p = .02$) emerging as a statistically significant predictor and ego-integrity ($p = .06$) emerging as a marginally significant predictor (see Table 5.19). Individuals with higher tolerance for risk demonstrated decision making styles in line with satisficing, while those demonstrating more psychosocial balance with respect to integrity versus despair were more likely to show decision styles consistent with maximizing.
**Self-Rated Affect**

The Positive and Negative Affect Schedule (PANAS) was used to measure the extent to which a negative affect was generated by the threatening decision context, as was intended. Independent samples T-tests indicated that the negative affect of individuals in the life threatening condition \( (M = 10.54; SD = 2.58) \) and the mundane condition \( (M = 10.75; SD = 2.67) \) did not significantly differ \( (p = .54) \). Similarly, there was no significant difference in positive affect \( (p = .61) \) reported by participants based on their assigned condition. Interestingly, positive affect scores were roughly twice as high as the negative affect scores for participants in both the threatening \( (M = 20.04; SD = 2.97) \) and the mundane \( (M = 19.83; SD = 2.63) \) conditions.

**Summary of Results**

Analyses revealed mixed results for the hypotheses put forward in Specific Aims 1-4. For Specific Aim 1, results were mixed regarding the impact of decision context on decision making competence. As hypothesized, participants in the threatening condition were less resistant to sunk cost bias than were those in the mundane condition.

Hypotheses pertaining to the impact of self-esteem on decision making competence were not supported. Specific Aim 2 was undoubtedly the most disappointing. No main or interaction effects were discovered between decision context, self-esteem, age, and preferences for collaborative decision making. Thus, the hypothesized relationships pertaining to Specific Aim 2 regarding the impact of decision context and self-esteem on preferences for collaborative decision making were not supported.

Specific Aim 3 revealed that individual difference factors did have an impact on participants’ decision making competence. Several of the hypothesized relationships
came to fruition in the results. First, participants with time horizons oriented toward the future were significantly more resistant to framing errors than individuals with time perspective oriented more towards the present or past. Second, ego-integrity did not predict decision making competence as was hypothesized, but did impact older adults’ decision making style such that participants demonstrating more psychosocial balance with respect to integrity versus despair were more likely to embrace a maximizing decision making style in both conditions. Finally, as hypothesized, risk tolerance predicted decision making style across both conditions such that individuals with higher risk tolerance were more likely to report a satisficing decision making style while those less tolerant of risk were more likely to report decision making styles consistent with maximizing.

Specific Aim 4 offered support to the notion that previous experience with a cancer diagnosis may have the potential to impact decision making competence and the way in which decisions are made, in a number of ways. The next chapter will offer a critical discussion of these results in the context of the specific aims and hypotheses. In addition, the Discussion will address potential implications and areas of application for the results of this study, in addition to study limitations and future directions.
Table 5.1

*Resistance to Framing: Effect of Age, Context, and Self-Esteem on Decision Making*

*Competence*

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\[ F = (7, 174) = 1.11, p = .35, R^2 = .04 \]

* indicates statistical significance at p \(\leq .05\)
### Table 5.2

**Resistance to Sunk Costs: Effect of Age, Context, and Self-Esteem on Decision Making**

#### Competence

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* indicates statistical significance at p $\leq .05$

$$F = (7, 191) = 4.87, \quad p = .01, \quad R^2 = .15$$
Table 5.3

*Under/Overconfidence: Effect of Age, Context, and Self-Esteem on Decision Making*

*Competence*

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$F = (7, 190) = .84, p = .55, R^2 = .03$

* indicates statistical significance at $p \leq .05$
Table 5.4

*Maximizing Tendency: Effect of Age, Context, and Self-Esteem on Decision Making*

**Competence**

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\[ F = (7, 190) = 1.64, p = .13, R^2 = .06 \]

* indicates statistical significance at p ≤ .05
Table 5.5

*Medical Treatment Decision: Effect of Decision Context, Age, and Self-Esteem on Preferences for Collaborative Decision Making*

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\[
F = (6, 191) = 1.62, \ p = .14, \quad F = (6, 183) = .65, \ p = .69,
\]

\[
R^2 = .05 \quad R^2 = .02
\]

* indicates statistical significance at \( p \leq .05 \); Extent of Decisional Control Preferred (Control), Frequency of Preferred Collaboration (Frequency)
Table 5.6

*Automotive Purchase Decision: Effect of Decision Context, Age, and Self-Esteem on Preferences for Collaborative Decision Making*

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$F= (6, 192) = .82, p = .57$  
$R^2 = .03$  

$F= (6, 185) = .19, p = .98$  
$R^2 = .98$

* indicates statistical significance at $p \leq .05$; Extent of Decisional Control Preferred (Control), Frequency of Preferred Collaboration (Frequency)
Table 5.7

*Retirement Plan Decision: Effect of Decision Context, Age, and Self-Esteem on Preferences for Collaborative Decision Making*

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$F=(6, 191) = .41, p = .87$  
$R^2 = .01$

$F=(6, 186) = .46, p = .84$  
$R^2 = .02$

* indicates statistical significance at $p \leq .05$; Extent of Decisional Control Preferred (Control), Frequency of Preferred Collaboration (Frequency)
Table 5.8

Resistance to Framing: Effect of Individual Differences and Decision Context on
Decision Making Competence

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<td>p</td>
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<td>.30</td>
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\[ F = (7, 89) = 1.85, p = .09 \quad F = (7, 82) = 1.22, p = .30 \]

\[ R^2 = .13 \quad R^2 = .09 \]

* indicates statistical significance at \( p \leq .05 \); Subjective Appraisal of Decision Making Competence (Subjective Appraisal)
Table 5.9

Resistance to Sunk Costs: Effect of Individual Differences and Decision Context on Decision Making Competence

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<td>.87</td>
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<td>.56</td>
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$F = (7, 89) = 1.85, p = .82 \quad F = (7, 90) = .39, p = .90$

$R^2 = .13 \quad R^2 = .03$

* indicates statistical significance at $p \leq .05$; Subjective Appraisal of Decision Making Competence (Subjective Appraisal)
Table 5.10

Under/Overconfidence: Effect of Individual Differences and Decision Context on Decision Making Competence

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<td>.72</td>
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<td>.04*</td>
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</table>

\[ F = (7, 90) = 1.85, p = .79 \]
\[ F = (7, 90) = .32, p = .32 \]
\[ R^2 = .12 \]
\[ R^2 = .08 \]

* indicates statistical significance at \( p \leq .05 \); Subjective Appraisal of Decision Making Competence (Subjective Appraisal)
Table 5.11

Maximizing Tendency: Effect of Individual Differences and Decision Context on Decision Making Competence

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<td>Mundane</td>
<td>Threatening</td>
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<td>$p$</td>
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<td>.94</td>
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$F = (7, 92) = 7.03, p = .01$  
$F = (7, 89) = 2.49, p = .02$  
$R^2 = .34$  
$R^2 = .16$

* indicates statistical significance at $p \leq .05$; Subjective Appraisal of Decision Making Competence (Subjective Appraisal)
Table 5.12

The Effect of Context and Cancer Experience on Decision Making Competence: Means and Standard Deviations

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<td>Resistance to Framing</td>
<td>12.59</td>
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<tr>
<td></td>
<td>9.52</td>
<td>(6.23)</td>
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<td>Resistance to Risky Choice Framing</td>
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<td>(5.16)</td>
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<tr>
<td></td>
<td>5.93</td>
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<tr>
<td>Resistance to Attribute Framing</td>
<td>4.22</td>
<td>(3.10)</td>
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<tr>
<td>Subjective Appraisal</td>
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* indicates statistical significance at p ≤ .05; Subjective Appraisal of Decision Making Competence (Subjective Appraisal)
Table 5.13

The Effect of Context and Cancer Experience on Preferences for Collaborative Decision Making: Means and Standard Deviations

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<tr>
<td>Control</td>
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<td>1.95 (0.63)</td>
<td>2.04 (0.38)</td>
<td>1.87 (0.69)</td>
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<tr>
<td>Frequency</td>
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<td>3.87 (1.05)</td>
<td>4.24 (0.89)</td>
<td>3.86 (1.15)</td>
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<tr>
<td><strong>Automotive Purchase Decision</strong></td>
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<tr>
<td>Control</td>
<td>1.95 (0.57)</td>
<td>1.98 (0.82)</td>
<td>2.04 (0.89)</td>
<td>1.83 (0.67)</td>
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<tr>
<td>Frequency</td>
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<td>3.61 (1.12)</td>
<td>3.80 (1.07)</td>
<td>3.54 (1.16)</td>
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<tr>
<td><strong>Retirement Plan Decision</strong></td>
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<tr>
<td>Control</td>
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<td>1.85 (0.68)</td>
<td>2.13 (0.83)</td>
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<tr>
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* indicates statistical significance at p ≤ .05; Extent of Decisional Control Preferred (Control), Frequency of Preferred Collaboration (Frequency)
Table 5.14

Resistance to Framing: Effect of Individual Differences, Context and Cancer Experience on Decision Making Competence

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<td>1.62</td>
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<td>-2.17</td>
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<td>Risk Tolerance</td>
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<td>.39</td>
<td>.69</td>
<td>.36</td>
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<td>.69</td>
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<td>2.94</td>
<td>1.73</td>
<td>.09</td>
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$F = (8, 90) = 1.72, p = .10$  

$R^2 = .14$  

$F = (8, 90) = 1.26, p = .68$  

$R^2 = .11$

* indicates statistical significance at $p \leq .05$
Table 5.15

Resistance to Risky-Choice Framing: Effect of Individual Differences, Context, and Cancer Experience on Decision Making Competence

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<td>-1.59</td>
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<td>-.78</td>
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<tr>
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<td>.42</td>
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</tr>
<tr>
<td>Risk Tolerance</td>
<td>.16</td>
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<td>.83</td>
<td>-.22</td>
<td>-.34</td>
<td>.74</td>
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<td>.12</td>
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\[ F = (8, 96) = 1.85, p = .08 \]
\[ F = (8, 93) = 1.64, p = .13 \]
\[ R^2 = .14 \]
\[ R^2 = .13 \]

* indicates statistical significance at p ≤ .05
Table 5.16

Resistance to Attribute Framing: Effect of Individual Differences, Context, and Cancer Experience on Decision Making Competence

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<tbody>
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\[F = (8, 95) = 1.99, \ p = .06\] \[F = (8, 91) = .92, \ p = .08\]

\[R^2 = .16\] \[R^2 = .08\]

* indicates statistical significance at \(p \leq .05\)
Table 5.17

*Resistance to Sunk Costs: Effect of Individual Differences, Context, and Cancer Experience on Decision Making Competence*

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\[ F(8, 98) = .79, p = .61 \quad F(7, 82) = 1.22, p = .05 \]

\[ R^2 = .07 \quad R^2 = .09 \]

* indicates statistical significance at \( p \leq .05 \)
Table 5.18

*Under/Overconfidence: Effect of Individual Differences, Context, and Cancer Experience on Decision Making Competence*

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\[ F = (8, 97) = 1.02, p = .43 \]
\[ F = (8, 97) = .78, p = .62 \]

\[ R^2 = .02 \]
\[ R^2 = .07 \]

* indicates statistical significance at p ≤ .05
Table 5.19

*Maximizing Tendency: Effect of Individual Differences, Context, and Cancer Experience on Decision Making Competence*

<table>
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\[ F = (7, 98) = 6.48, p = .01 \quad F = (7, 97) = 2.65, p = .02 \]

\[ R^2 = .33 \quad R^2 = .17 \]

* indicates statistical significance at \( p \leq .05 \)
Figure 5.1

*Resistance to Framing: Interaction Effect between Cancer Experience and Decision Context*
Figure 5.2

*Resistance to Attribute Framing: Interaction Effect between Cancer Experience and Decision Context*
Figure 5.3

Mean Decision Accuracy: Interaction Effect between Cancer Experience and Decision Context
Figure 5.4

Subjective Appraisal of Decision Making Competence: Interaction Effect between Cancer Experience and Decision Context
Chapter Six: Discussion

The focus of this dissertation’s research was to understand the impact of decision context, self-esteem, individual differences, and cancer experience on older adults’ decision making competence, and preferences for collaborative decision making. In addressing this question, there were several key findings that emerged which warrant further discussion. This chapter presents the discussion of the research results within the context of previous research and several pertinent psychological theories. In addition, this final chapter presents limitations of this dissertation study, and provides suggestions for future research.

Specific Aim 1

Specific Aim 1 focused on the impact of context and self-esteem on older adults’ decision making competence. Older adults’ decision making competence was measured across 3 subscales: Resistance to framing, resistance to sunk costs, and under/overconfidence. It was hypothesized that older adults in the life threatening condition would demonstrate overall poorer decision making competence across the decision making subscales than their counterparts in the mundane condition. This hypothesis was partially supported by the results. It was also hypothesized that individuals with higher self-esteem would demonstrate better decision making competence across subscales than those with low self-esteem. This hypothesis was not supported by the results.

Effect of Decision Context on Resistance to Sunk Costs. Older adults’ ability to resist sunk costs was predicted by decision context such that individuals in the life threatening condition were less resistant to the sunk cost bias than those individuals in the
mundane condition. Not surprisingly, participants’ aggregate scores were fairly good on
this measure. Numerous studies have shown that the ability to resist the sunk cost bias
generally increases with age, such that older adults are more likely to make normatively
correct decisions than their younger counterparts, with respect to the sunk-cost bias
(Bruine de Bruin, Parker & Fischhoff, 2007; Strough, Mehta, McFall & Schuller, 2008).

Regarding the observed difference between decision contexts, some insight might
be gleaned from research proposing a theoretical relationship between the sunk cost
fallacy and loss aversion (Soman, 2004). This literature suggests that individuals may
choose to diminish attention to losses in order to maintain positive emotions (Strough et
al., 2012). This relationship makes sense in the context of Socio-emotional Selectivity
Theory (Carstensen, 2006), which asserts that individuals are motivated to maximize
their emotional experiences “here and now” when temporal horizons are perceived as
restricted.

In the context of this dissertation, it may be that older adults (whose temporal
horizons are already restricted to some degree as a function of age) in the life threatening
condition felt an acute restriction being placed on their temporal horizon as a function of
the threatening nature of the decision items they encountered. Older adults in the
threatening condition may have correspondingly dampened their attention to losses in
order to maintain emotional positivity, thereby allowing themselves to fall prey to the
sunk cost bias. Future research should examine more deeply the relationship between
loss aversion, sunk costs, and the positivity bias in older adults, and the role that decision
context might play in moderating those relationships.
Effect of Self-Esteem on Decision Making Competence. Given previous research demonstrating the buffering effect of self-esteem on individuals’ ability to function and make decisions in contexts which typically cause anxiety and stress, it was hypothesized that older adults with higher self-esteem would demonstrate better decision making competence across subscales than those with lower self-esteem, particularly in the threatening condition. This hypothesis was not supported by the data.

One potential explanation for this lies in the fact that participants’ self-esteem was extremely high among the sample in this dissertation. The fact that self-esteem was so high is surprising given research which has suggested that self-esteem follows a predictable trajectory, increasing during young and middle adulthood, peaking at age 60, and declining thereafter (Orth et al., 2010). Given that the mean age of this sample was 68, signifying that on average the self-esteem of the majority of the sample would have peaked roughly 8 years ago, a more evenly distributed range of self-esteem scores might have been expected. Socio-demographic variables may be the source of the disparity. The current sample was generally well educated, healthy, and above the median household income level. Research has suggested that education, income, health, and employment status all have an impact on the self-esteem trajectories, especially as people age (Orth, 2010).

Effect of Self-Esteem and Decision Context on Decision Competence.

Finally, it was hypothesized that self-esteem would alter the strength of the relationship between decision context and competence. This hypothesis was not supported by the results. One possibility is that the global measure of self-esteem utilized in the current study was not the most appropriate moderator of this relationship. Perhaps a measure of
decisional self-esteem (Mann, 1988) would have been a more robust moderator of the context-competence relationship. Decisional self-esteem is a more specific construct which represents the individual’s self-esteem as a decision maker specifically, rather than as a person in general. Such a measure would have spoken more to participants’ confidence as a decision maker, which may have played a more significant role in dictating the extent to which decision context impacted decision making competence. Future studies examining the relationship between self-esteem, decision context, and decision competence should compare the impact of global self-esteem versus decisional self-esteem.

The results pertaining to self-esteem, although null, are not necessarily without theoretical support. According to the anxiety-buffer hypothesis of Terror Management Theory, stably high or temporarily raised self-esteem acts as a buffer against anxiety associated with thoughts of mortality (Greenberg et al., 1992). In the context of the sample of this dissertation, which reported high aggregate levels of self-esteem, it is possible that the anticipated reaction (stress/anxiety) to the threatening decision context was neutralized by participants’ high self-esteem. That is, individuals in the threatening condition may not have felt threatened by the manipulation, as a function of the anxiety buffering effects of their high self-esteem. Future studies exploring the relationship between decision context, self-esteem, and decision making competence are encouraged to embrace a more purposive sampling effort around the sample’s self-esteem distribution.

Another possibility is that participants were largely unthreatened by the manipulation as a function of their age and/or lived experience. There is some evidence
to suggest that older adults react differently to life threatening contexts and reminders of
mortality than their younger counterparts. For example, Maxfield and colleagues (2007)
found that older adults responded more strongly (increased death related anxiety) to
incidental exposure to death related words than to the classic mortality salience induction
techniques used widely in Terror Management experiments. Greenberg (2011)
speculated that this result could be a function of older adults’ overexposure to blatant
reminders of death in their daily life, resulting in an increased sensitivity to more subtle
reminders. The classic technique of inducing mortality salience was not used in this
study, in part because this previous work (Maxfield et al., 2007; Greenberg, 2011).
However, it is still possible that the approach for inducing threat used in this study was
still not subtle enough. Future studies should continue to study and report on the most
effective techniques for inducing mortality salience in the older adult population.

**Specific Aim 2**

Specific Aim 2 focused on the impact of decision context and self-esteem on
older adults’ preferences for collaborative decision making in three different hypothetical
decision scenarios. It was hypothesized that individuals in the life threatening condition
would report stronger preferences for collaboration as a means of minimizing the stress
associated with the threatening decision. This hypothesis was grounded in previous
research suggesting that in buffering themselves from the anxieties associated with
thoughts of mortality, older adults may attempt to strengthen social bonds with a
preferred group such as family or their social network (Baumeister & Leary, 1995;
Greenberg, 2011). Yet all six models examining the influence of decision context, age,
and self-esteem on preferences for collaborative decision making failed to reach significance.

**Effect of Decision Context on Preferences for Collaborative Decision Making.**

It was thought that individuals encountering the threatening decision context would express stronger preferences for collaboration as a means of minimizing the threat/anxiety placed upon the self. This expectation was not reflected in the results.

One possible explanation is that the threatening nature of the decision context may have been neutralized by participants’ high self-esteem. That is, individuals in the life threatening condition may for the most part, not have been threatened by the manipulation, as a function of the anxiety buffering effects of their high self-esteem (Solomon, Greenberg & Pyszczynski, 1991). Correspondingly, they would not express inflated preferences for collaboration as a function of threat, compared to the mundane condition, if they were buffered from the threat by their self-esteem (Greenberg, 2011).

Another possible explanation for the lack of differences in preferences for collaboration between conditions concerns the way in which collaborative preferences were measured. In the absence of a standardized and validated measure of preferences for collaborative decision making, this study utilized a modified measure in which the same three hypothetical scenarios were presented to participants in both conditions and preferences for collaboration were ascertained for each scenario. Perhaps a better approach, in keeping with the spirit of the cancer-valenced manipulation, would have been to have individuals in the life-threatening condition express their collaborative preferences in hypothetical decision scenarios involving cancer. Such an approach may have spoken more directly to preferences for collaboration involving cancer, in which
death is an implied possibility, and highlighted more clearly the differences in collaborative preferences between condition groups in this study. Future research examining the impact of a threatening decision context on preferences for collaboration should test the impact of different methods of ascertaining participants’ collaborative preferences, including the use of hypothetical scenarios which are more deliberately threatening in how they are framed.

**Effect of Self-Esteem and Decision Context on Preferences for Collaborative Decision Making.** In examining the effect of self-esteem and decision context on preferences for collaborative decision making it was hypothesized that: a) Individuals with higher self-esteem would demonstrate overall weaker preferences for collaboration than those with lower self-esteem, and that b) self-esteem would alter the strength of the relationship (moderator effect) between decision context and preferences for collaboration. Both hypotheses were unsupported by the results.

One possible explanation for the null results pertaining to self-esteem, decision context, and preferences for collaborative decision making is that a global measure of self-esteem (Rosenberg et al., 1995) is not the best predictor/moderator of these relationships. The Rosenberg Self-esteem Scale (Rosenberg, 1965), which is designed to capture the individuals’ overall positive or negative orientation towards themselves, may simply not be sensitive enough to capture domain specific self-esteem.

A context/domain specific measure of self-efficacy (Bandura, 1986), which specifically measured participants’ self-confidence in the 3 hypothetical decision scenarios used in this study may have been more appropriate. Such a measure would take into account the participant’s self-confidence in each decision scenario, and then seek
insight into his or her preferences for collaboration in the same domain. Future research should explore the role of domain specific self-efficacy in predicting or moderating domain specific preferences for collaborative decision making.

**Specific Aim 3**

Specific Aim 3 of this dissertation focused on the impact of decision context and individual difference factors on older adults’ decision making competence. Based on previous research suggesting that individual differences may moderate decision makers’ susceptibility to fall prey to various decision biases, (Smith & Levin, 1996; Stanovich & West, 1999), it was expected that individual differences would play a role in predicting decision making competence. In the past, individual differences have been linked to the tendency to avoid framing errors (Levin, Gaeth, Schreiber & Lauriola, 2002), abandon sunk costs (Stanovich, 1999), apply decision rules (Broder, 2000), and express levels of confidence in line with their abilities (Blais, Thompson & Baranski, 2005; Bornstein & Zickafoose, 1999; Klayman, Soll, Gonzalez-Vallejo & Barlas, 1999; Stankov & Crawford, 1996, 1997; West & Stanovich, 1997; Wolfe & Grosch, 1990). The specific hypotheses regarding individual differences were partially supported by the results and individual differences were consistently predictive, at least in part, of older adults’ decision making competence.

**Effect of Individual Differences on Resistance to Framing.** For resistance to framing, both future time perspective and subjective appraisal of decision making competence were significant predictors of decision making competence in the mundane condition. Individuals with a time perspective oriented towards the future were found to
be more resistant to the framing error bias than those individuals with time perspectives oriented toward the present, or past.

Previous research has demonstrated a strong association between future time perspective and risk taking such that individuals with a stronger sense of future time perspective tend to be more risk averse (Zimbardo, 1999). In the current study, half of the resistance to framing items were valenced to reflect risky choices. Individuals with a stronger sense of future time perspective may tend to consider the choices they make more carefully (thereby avoiding framing error biases) than individuals focused on the present, as a function of the realization that choices will have a long-lasting impact over an extended period of time. More detailed consideration of resistance to framing items could have made the framing schema more apparent to these individuals, which may explain why individuals with a stronger sense of future time perspective were less susceptible to framing error biases.

Subjective appraisal of decision making competence predicted resistance to framing in the mundane condition such that individuals who rated themselves as being worse decision makers compared to their peers, were more resistant to the framing error bias than individuals who rated themselves as being better decision makers compared to their peers. This result makes sense given that this study also found that negative subjective appraisal of decision making competence predicted a maximizing decision making style. Research has shown that maximizers tend to exhibit less confidence in their ability to make decisions and experience more decision regret (Parker, Bruin de Bruin & Fischoff, 2007). Despite this lack of confidence, maximizers may also be less likely to fall prey to decision biases such as the framing error bias, as a function of their
deliberate, rational approach to the decision making process. Future research should continue to explore the link between subjective appraisal of decision making competence, maximizing tendency, and decision making competence outcomes.

**Effect of Individual Differences on Resistance to Sunk Costs.** For resistance to sunk costs, individual differences did not predict decision making competence in either the life threatening or mundane conditions. This result was particularly surprising for the future time perspective variable, as previous research has demonstrated that individuals with a greater sense of future time perspective show better resistance to sunk costs than individuals lacking a strong sense of present time perspective (Arkes & Blumer, 1985; Parker & Fischhoff, 2005; Ashraf, Berry & Shapiro, 2010). This would be expected as older adults with a future oriented time perspective would theoretically be more likely to focus on the future when making decisions in the present, as opposed to focusing on losses incurred in the past, which would be more characteristic of individuals with a heavy focus on the “here and now.” This result therefore does not support existing literature which has demonstrated a robust relationship between resistance to sunk costs and future time perspective.

**Effect of Individual Differences on Maximizing Tendency.** The tendency to maximize involves seeking the absolute best option, whereas the tendency to satisfice involves seeking the option that is simply good enough (Simon, 1955). Based on previous research demonstrating the tendency for maximizers to be more rational, less reliant on feelings and instincts (Slovic, Finucane, Peters & McGregor, 2004), and less spontaneous (Schwartz et al., 2002), it was hypothesized that risk tolerance would predict maximizing tendency. Specifically, it was thought that individuals with a lower tolerance
for risk would embrace decision making styles consistent with maximizing, while individuals with a higher tolerance for risk would embrace decision making styles in line with satisficing. This hypothesis was confirmed in both conditions.

Other individual difference factors were also found to predict maximizing tendency. In the mundane condition, older age, and negative subjective appraisal of decision making competence predicted a maximizing decision making style. In both conditions individuals with more psychosocial balance with respect to integrity versus despair were more likely to embrace a maximizing decision style.

The result that older adults were more likely to report decision styles in line with maximizing was surprising given past research demonstrating that older adults tend to use less information when making decisions (Finucane et al., 2005; Johnson, 1990; Meyer, Russo & Talbot, 1995; Patrick, 1995) and report decision making behaviors more in line with the concept of satisficing (Tanius, 2009) with increasing age. The literature suggests that a gradual shift toward satisficing may occur with increasing age, serving an adaptive function that allows older adults to make “good enough” choices without the burden of having to painstakingly search and analyze all of the various options (Baltes & Baltes, 1990). It is thought that this shift allows older adults to compensate for declines in cognitive function, and ultimately sustain high levels of function as a result of making the most of their resources (Baltes & Baltes, 1990). The results of this study, however, do not support the prevailing thought that decision making style trends toward satisficing with increasing age. Future studies should consider employing a longitudinal research design in order to directly examine the extent to which decision making style changes, and to what degree and direction it changes as a function of time and lived experience.
The fact that negative subjective appraisal of decision making competence predicted a maximizing decision making style was not surprising, given past research associating maximizing tendency with negative psychological outcomes. Intuitively, it is easy to assume that maximizers enjoy better decision outcomes than satisficers as the result of their deliberate, rational approach to the decision making process. However, research has implicated maximizing tendency with less behavioral coping, greater dependence on others when making decisions, less decision confidence, more avoidance of decision making, and a higher tendency to experience regret (Parker, Bruin de Bruin & Fischoff, 2007). Other researchers have found greater decision dissatisfaction among self-reported maximizers (Iyengar et al., 2006; Schwartz et al., 2002). Future research should continue to examine the impact of individual differences on maximizing tendency, and study how their relationship impacts psychological outcomes related to decision making (e.g. dependence, avoidance, regret, and confidence).

Specific Aim 4

Specific Aim 4 sought to understand the impact of cancer experience (whether or not a participant had been previously diagnosed) on older adults’ decision making competence and preferences for collaborative decision making. The first set of analyses focused on the impact of context, and cancer experience, on older adults’ decision making competence. The second focused on how decision context and cancer experience impacted older adults’ preferences for collaborative decision making in three different hypothetical decision scenarios.

There are several key factors thought to heavily influence the decision making process including: cognitive biases (Stanovich & West, 2008), age, individual differences
(Bruin, Parker & Fischoff, 2007), belief in personal relevance (Acevedo, & Krueger, 2004) and past experience (Juliussen, Karlsson & Garling, 2005). Specific Aim 4 was concerned with the impact of the latter, past experience with a cancer diagnosis, on decision making competence in the present. Researchers have found that past decisions tend to influence decisions made in the future (Juliussen, Karlsson & Garling, 2005). It makes sense that when something positive results from a given decision, people are more likely to decide in a comparable way in the future when making a similar decision (Dietrich et al., 2010). Correspondingly, individuals are likely to avoid repeating decisions that resulted in undesirable (negative) outcomes when making similar decisions in the future (Sagi & Friedland, 2007). Negative outcomes may also arise from the tendency toward a ‘belief bias’ wherein individuals over rely on past experiences (Marsh & Hanlon, 2007). The extent to which the specific experience of a previous cancer diagnosis impacts decision making competence is largely unexplored at this time.

**Resistance to Framing.** Whether or not participants’ had been diagnosed with cancer in the past predicted their susceptibility to framing effects. Framing effects occur when the choice between two logically equivalent problems elicit different choices based on subtle changes to the nature of the language used to describe the problem (Tversky & Kahnemann, 1981). Results indicated that older adults in the threatening condition who had been previously diagnosed with cancer were less resistant to the effects of framing than individuals who had not been previously diagnosed with cancer.

Similarly, when resistance to framing was examined into its two sub-parts (risky choice framing and attribute framing), it was discovered that individuals with a previous cancer diagnosis were less resistant to risky-choice framing errors when making
decisions related to cancer, than individuals who had not been previously diagnosed with cancer. Interestingly, among those who had not been previously diagnosed with cancer, individuals in the threatening condition were significantly more resistant to attribute framing than individuals in the mundane condition. Cancer experience therefore, appears to have had a mixed effect on individuals’ ability resist the effects of attribute-choice framing and risky-choice framing depending on the context in which the decision was being made.

**Resistance to Sunk Costs.** Previous experience with cancer also predicted participants’ susceptibility to the sunk cost bias. The sunk cost bias asserts that decision makers tend to be willing to continue with endeavors on which they have already invested resources, and hesitate to abandon those endeavors in which resources have already been invested (Arkes & Blumer, 1985). Analyses revealed that participants in the mundane condition were significantly more resistant to the sunk cost fallacy than those in the threatening condition, and that those with a previous cancer diagnoses were significantly more resistant to the sunk cost fallacy than those lacking a prior cancer diagnoses. Again, it appears that having a previous cancer diagnosis impacted participants’ decision making competence in a significant way, as those individuals with a previous cancer diagnosis were more resistant to sunk costs than individuals lacking cancer experience.

**Under/Overconfidence.** In examining the impact of cancer experience on under/over confidence, participants did not significantly vary as a function of decision context or previous experience with cancer. However, when the under/overconfidence
variable was separated into its two sub-parts (confidence and accuracy), some interesting results emerged.

Individuals in the mundane condition were significantly more confident in their choices than those individuals in the threatening condition, regardless of cancer experience. Individuals in the mundane condition were also significantly more accurate in their decision making compared to those in the threatening condition, regardless of cancer experience. This is not particularly surprising given that the under/overconfidence items in the mundane condition survey consisted of questions largely pertaining to everyday knowledge (e.g. “True or False- Thanksgiving Day is always the fourth Thursday in November”) while the threatening condition survey items were all cancer specific (e.g. “True or False- Smokers exposed to asbestos are at an increased risk for developing lung cancer”). It is likely that most of the participants in the mundane condition had experience with the question items and were, therefore, more confident and accurate in answering compared to the cancer-related items encountered by those in the threatening condition.

In general, the level of confidence reported by participants in this dissertation was generally in line with their actual abilities. That is, there was very little instance of drastic under confidence and/or over confidence. This is in line with previous research suggesting that older adults tend to demonstrate highly accurate meta-knowledge evaluations (Kovalchick et al., 2003). Older adults have also been found to more frequently respond that they are either completely certain (100%) or completely unsure (50%) compared to their younger counterparts. These results supported the current view
that older individuals have an accurate understanding of their own knowledge and its limitations.

**Subjective Appraisal of Decision Making Competence.** Subjective appraisal of decision making competence refers to the individual’s perception of his or her own decision making competence in comparison to that of his or her peers. In short, results indicated that for those who had been diagnosed with cancer in the past, individuals in the mundane condition rated themselves more positively as decision makers than those in the threatening condition. This result may suggest that participants who have gone through the cancer experience may view themselves as decision makers in a more negative light when making cancer-related decisions. Future research should investigate the extent to which the experience of having been diagnosed with cancer impacts the way in which individuals make decisions, the outcomes of those decisions, and the way in which individuals perceive themselves as decision makers.

**Effect of Cancer Experience on Decision Making Competence.** These results suggest that cancer experience may have an impact on decision making competence, and that the effect may differ in both direction and magnitude based on the context of the decision, and the decision making ability being evaluated. The mechanisms behind this effect are not well understood based on the results of this study, but certainly warrant further attention. In general, there are a number of possible reasons why the experience of cancer could have a lasting impact on decision making competence. Two such reasons are: a) The nature of the cancer experience, and b) the potential for cognitive effects.

**Experience.** The decisions made during the course of a cancer experience, and the outcomes that derive from those decisions, certainly have the potential to impact the way
in which cancer survivors make decisions in the future (Juliusson, Karlsson & Garling, 2005). Individuals who make decisions related to their cancer that result in positive outcomes may feel more empowered to make difficult decisions in the future (Dietrich et al., 2010). Those who make decisions that result in poor outcomes however, may experience feelings of decision regret, and doubt their ability to make similar decisions in the future (Sagi & Friedland, 2007).

The nature of the cancer experience, including the extent to which it causes distress and trauma, is likely to impact decision making competence. Research has indicated that individuals tend to experience cancer-related distress at different magnitudes and for different lengths of time as a function of their cancer experience (Henselmans et al., 2010). Roughly one-third of individuals diagnosed with cancer report having a relatively un-traumatic cancer experience and report minimal distress associated with their diagnosis, while one-fifth of individuals report a traumatic cancer experience with long lasting effects on psychological variables (e.g. distress, depression, avoidance,) (Stanton, 2012). Thus, there is a significant segment of the survivor population who experience steady positive function over time in psychological domains, while others experience persistently hindered psychological outcomes over extended periods of time, sometimes without recovery (Stanton, 2012). The way in which cancer is experienced is likely to have unique and potentially lasting effects on individuals’ psychological health, which certainly has the potential to influence decision making processes and outcomes. Future studies should examine the link between cancer experience, psychological outcomes associated with cancer, and decision making competence in order to inform the development of programs and interventions aimed at minimizing the negative
psychosocial effect of the cancer experience and its potential to negatively impact decision-making competence.

**Cognitive Effects.** Depending upon the treatments undergone as part of the cancer treatment regimen, patients often experience lasting cognitive and neurological effects of their cancer treatment. It is widely acknowledged in the scientific and oncology communities that many chemotherapy agents have a negative impact on brain function for some cancer patients (Han et al., 2008). The term, “chemo-brain” has been used to describe this phenomenon which encompasses symptoms including: short-term memory loss, difficulty processing and concentrating, vision loss, and even dementia (Stewart et al., 2008). This research suggests that the majority of cancer survivors experience short-term memory loss and difficulty concentrating following their treatment (Stewart et al., 2008). Other research has indicated that 82% of breast cancer patients report suffering from some form of cognitive impairment (Han et al., 2008) for a short period of time following their treatment.

Such cognitive effects clearly have the potential to impact decision-making competence beyond the initial experience of cancer. These effects may be especially compounded in older adulthood, a period in which normative cognitive declines are known to occur. Future research should examine more closely the relationship between age, cancer treatments, cognitive change as a function of cancer treatments, and decision-making competence.

**Effect of Cancer Experience on Preferences for Collaboration.** Initial analyses (Specific Aim 2) offered very little explanation regarding the relationship between decision context and preferences for collaborative decision making. In search of
further understanding, follow-up analyses were conducted taking into consideration participants’ past experience with cancer diagnosis (whether or not they had been diagnosed with cancer). For each decision domain, which included making a treatment decision, purchasing a vehicle, and adding an annuity to a retirement savings fund, participants indicated the amount of control they preferred and the frequency with which they preferred to collaborate on similar decisions.

Results revealed that cancer experience did not impact the amount of control participants desired to have, or the frequency with which they preferred to collaborate, when making experimental medical decisions, or automotive purchasing decisions. However, results indicated that when making a retirement plan decision, those with a previous cancer experienced preferred significantly more collaboration than those lacking previous cancer experience. One explanation for this finding is that those individuals who have experienced cancer are made more aware of their financial situation as a result of the high costs associated with cancer treatment and late effects. It is no secret that cancer is an expensive diagnosis. In fact, of the top ten most expensive medical conditions in the United States, cancer has the highest per-person cost (American Cancer Society, 2012). Thus participants with previous cancer experience may prefer more collaboration when making significant financial decisions as a result of having experienced the high cost of cancer in the past. Future research should examine the effect of a previous cancer diagnosis on individuals preferences for collaborative when making significant financial decisions.

**Summary.** The results regarding the effect of cancer experience on older adults’ decision making competence and preferences for collaborative decision making showed
mixed effects. There were instances wherein previous cancer experience appeared to have a positive effect on participants’ decision making competence and other instances wherein a previous cancer diagnosis seemed to hinder decision making competence performance. In other instances, previous cancer experience did not seem to have any effect on decision making competence outcomes. Although the direction and magnitude of the effect of previous cancer experience on decision making competence is not entirely clear, the results of this dissertation suggest that cancer experience has the potential to impact decision making competence beyond the initial cancer decision making process.

Limitations and Future Directions

The present study makes several novel contributions to the gerontological, decision making and cancer survivorship literatures regarding the effect of context, individual difference factors, and cancer experience on older adults’ decision making competence. However, there are also several limitations of this dissertation centered on the sample, recruitment strategy, and manipulation design worth discussing.

The first limitation is that the sample lacked socio-demographic diversity, which is likely to have influenced the results. Participants were predominantly white, community dwelling older Americans in very good to excellent self-reported physical condition. The findings reported in this dissertation may not generalize to other races, institutionalized groups, or individuals who identify as being less healthy. This is particularly significant given that the sample consisted of older adults, who are more likely to be in assisted living/nursing home facilities, and in poorer health than their younger counterparts. The sample in this dissertation is not therefore representative of the general population of older adults with respect to health and institutionalization.
Another limitation of this dissertation related to sample is that the study participants overwhelmingly rated themselves as having high self-esteem. It is likely that this contributed to the results and affected the ability to reliably test key hypotheses related to self-esteem. Such overwhelmingly positive reports of self-esteem were not anticipated during the design of this study; particularly given life-span development research suggesting that self-esteem generally peaks at age 60, and declines thereafter (Orth et al., 2010). Future studies testing the impact of self-esteem on decision making competence, could explore a more purposive sampling effort to ensure a more normal distribution of self-esteem scores. The results reported in this dissertation cannot likely be generalized to a population of individuals with lower self-esteem.

Ensuring a more representative study sample with respect to self-reported health and institutionalization may have also helped to yield a more normal distribution of self-esteem scores, which would have allowed for a more thorough understanding of the impact of self-esteem on decision making competence and preferences for collaborative decision making. Future studies should explore the impact of context, self-esteem, and cancer experience on decision making competence in a more diverse population of older adults.

Another limitation of this study concerns the reliance on participant self-report for collecting data. Self-reports are prone to a number of well documented biases which can affect the study results including the tendency for participants to exaggerate, conform to social desirability, and forget (recall bias). It is also well understood that individuals bring their own interpretations to bear when answering questionnaire items (Schwartz, 1999). For example, the way in which the word “collaboration” was interpreted by
participants may have varied across the sample, despite being defined in the survey instrument. In the past, researchers have found that participants interpret “collaboration” to mean a variety of things including: receiving support, providing support, or working together in a completely egalitarian fashion (Strough, 2004). Future studies should attempt to study the relationship between decision context and competence in a laboratory or real-life setting, to offset the impact of self-report biases.

A final limitation regards the manipulation used in the life threatening condition. In essence, the goal of the manipulation was to induce mortality salience, or, a heightened awareness of the reality of death, among the participants in the life-threatening condition (Greenberg, 2011). It was thought that repetitive exposure to decision making problems involving cancer would be enough of a manipulation to cause this heightened awareness. Based on the results, it is possible that the manipulation failed to invoke a heightened awareness of the reality of death. Additional evidence that the manipulation was not strong enough comes from the results of the Positive and Negative Affect Schedule (PANAS) wherein neither the negative nor positive affect of participants differed significantly by condition after completing the decision making competence items in the survey. It was expected that if the manipulation was successful at inducing mortality salience, it would be evident in the PANAS negative affect score.

Terror Management experiments typically use a strategy for inducing mortality salience which involves asking participants to respond to two prompts. First they are asked to describe the emotions that thinking about their own death arouses in them. Second they are asked what they think will happen to them as they are dying and once
they are dead. This method of inducing mortality salience involves very explicitly prompting the participant to consider his or her own death.

This study did not utilize the conventional strategy for inducing mortality salience. Rather, decision items from the Adult Decision Making Competence scale were modified to reflect cancer related decisions. It was reasoned that the participant would recognize the possibility of death when making decisions related to cancer. This more subtle method of inducing mortality salience was developed based on research suggesting that older adults responded more strongly to incidental exposure to death related words than to the classic Terror Management methods of inducing mortality salience (Maxfield et al., 2007). The most appropriate method for experimentally inducing mortality salience in the older adult population remains unclear. Future studies should examine this issue in greater detail, perhaps comparing different methods of mortality salience induction in a randomized controlled trial of older adults.

The results of this research suggest additional future research possibilities in the field of decision making competence in older adults. Specific areas include: (a) further exploration of the impact of decision context on decision making competence; (b) further exploration of the impact of previous cancer experience on decision making competence; and (c) reconceptualization of the way in which individual differences are discussed and reported in decision making research.

This dissertation research suggests that the context in which older adults make decisions does seem to have an impact on decision making competence. This is particularly interesting given that in some instances, older adults in the life-threatening decision context appeared to be more susceptible to decision making biases (sunk costs).
than those in the mundane condition. This result warrants future study as older adults are increasingly likely to face decisions in life threatening contexts. The extent to which decision making competence is impacted by life threatening contexts is a research question with real-life implications and should be further investigated by future research.

Older adults’ previous experience with cancer (previously diagnosed, or not previously diagnosed) had a significant impact on decision making competence performance. Furthermore, this dissertation research revealed significant and repeated interaction effects between condition and cancer experience. The fact that participants who had previously been diagnosed with cancer responded differently to cancer-related decision items than those who had not previously been diagnosed is not particularly surprising. What is of interest, and warrants future research, is the inconsistency in the direction of the effect of cancer experience on decision making competence. Previous experience with cancer seemed to have both beneficial and hindering effects on older adults’ decision making competence. Future research is needed to begin to flesh out the lasting impact of cancer experience on older adults’ decision making competence in and outside of the context of cancer decisions. As the cancer survivorship period expands and the overall number of survivors continues to grow, it will be critical to understand the lasting impact of cancer experience on decision making performance.

A final recommendation for future research is broader in scope, and concerns the way in which individual differences are used and tested in decision making and judgment research. There is a vast psychological literature on individual differences with significant overlap and mixed results. There has been a push in recent years to publish a broader scope of results related to individual differences, rather than focusing exclusively
on interactions and correlations that reach statistical significance (Appelt et al., 2011). Only reporting and sharing significant results is a serious problem, as they represent only a small fraction of the actual results (Bradley & Gupta, 1997; Howard et al., 2009; Pautasso, 2010; Rosenthal, 1979). This issue makes searching and interpreting the existing literature a taxing task and frequently leads to unnecessary replication of research questions. Future researchers and editors interested in investigating individual differences in older adults should embrace the recommendations of the field’s leaders (Appelt et al., 2011) and report results beyond those of statistical significance. It’s likely that the field would benefit from a large scale embrace of this recommendation.

**Conclusion**

This dissertation research focused on the impact of decision context, self-esteem, and other individual difference factors on decision making competence and preferences for collaborative decision making in a sample of community dwelling older adults. The extent to which having been diagnosed with cancer in the past impacted older adults’ decision making competence and preferences for collaborative decision making was also examined.

The results of this research raise interesting new questions about the impact of decision context and previous experience with cancer, on older adults’ decision making competence. Results showed: a) decision context did impact older adults’ decision making competence, b) several individual difference factors predicted older adults’ decision making competence, and c) previous experience with a cancer diagnosis, or lack thereof, had a significant impact on individuals’ decision making competence and preferences for collaborative decision making.
Guided by Terror Management Theory, this study is one of the first to examine the effect of context and cancer experience on older adults’ decision making competence. Study findings support previous work demonstrating the challenges associated with applying tenants of Terror Management Theory to a population of older adults, as compared to younger populations (Maxfield et al., 2007). The extent to which the relationship between Terror Management Theory (i.e. mortality salience, anxiety buffering) and human thoughts and behavior change as a function of age and lived experience are not well understood at this time. However it seems likely, based on this study and previous work (Maxfield et al., 2007), that human development plays a role in dictating the relationship between Terror Management Theory and human thought and behavior that is not accounted for in current conceptualizations of Terror Management Theory. Additional research is needed to delve more deeply into this area and examine other ways in which Terror Management Theory might be adjusted to account for age and experience. Future work should continue to study age and human development in the context of Terror Management Theory, and develop conceptual models for understanding their interaction more clearly.

The results of this study also have real-world implications for older cancer survivors and highlight the need for continued study. Age is the single greatest risk factor for developing cancer in the United States, with over 60 percent of cancers diagnosed in individuals age 65 or older (American Cancer Society, 2012). Correspondingly, cancer survivorship among older adults is at an all-time high, with 13.7 million Americans living with a history of cancer, of which 50% are age 60 or older (American Cancer Society, 2012). The fact that incidence rates of cancer in older
adulthood will continue to rise in coming years is well understood. The extent to which cancer experience impacts survivors’ critical ability to make competent decisions in differing contexts, however, is not yet clear. Understanding the effect of cancer experience, context, and age is especially important as cancer treatment decision making becomes more and more complex, and patients are increasingly expected and encouraged to be an active participant in the treatment decision making process (Hercinger, 2007).

This dissertation research suggests that decision context and individual difference factors have an impact on older adults’ decision making competence. Further, this research suggests that cancer experience may have a lasting impact on older adults’ decision making competence, but that there is still considerable work to be done to determine the direction and magnitude of this effect under varying contexts and circumstances. Gaining a clearer understanding of the relationship between cancer experience and decision competence, and the constellation of factors which affect their bond, may help towards the development of tailored interventions and programs aimed at maximizing older adults’ decision making competence across contexts.
APPENDICES

Appendix A: Recruitment Flyer
Appendix B: Decision Making Competence Items by Condition
Appendix C: Dissertation Questionnaire Measures
Appendix D: Cover Letter/Study Description
APPENDIX A: STUDY RECRUITMENT FLYER
Hello! My name is Christopher Gayer. I am a graduate student at the University of Kentucky in the Graduate Center for Gerontology. I am looking for adult’s ages 55+ to help with my dissertation study.

I am looking for about 200 people to volunteer to complete a questionnaire on how adults make decisions in different situations. The questionnaire takes about 45 minutes to complete and includes questions about your preferences for involving others in your decisions, self-esteem, and risk taking, as well as some basic questions about your health. The information that you provide will be anonymous and held in confidence.

If you wish to participate, or would like more information about the study, please contact me via
Email: ccgaye2@uky.edu or phone: (859) 218-0179

Thank You Very Much for Your Participation!!
APPENDIX B: DECISION MAKING COMPETENCE ITEMS BY CONDITION
1. Resistance to Risky-Choice Framing

A. Mundane

A1. Imagine that recent evidence has shown that a pesticide is threatening the lives of 1,200 endangered animals. Two response options have been suggested: If Option A is used, 600 animals will be saved for sure. If Option B is used, there is a 75% chance that 800 animals will be saved, and a 25% chance that no animals will be saved. Which option do you recommend?

A2. Because of changes in tax laws, you may get back as much as $1200 in income tax. Your accountant has been exploring alternative ways to take advantage of this situation. He has developed two plans: If Plan A is adopted, you will get back $400 of the possible $1200. If Plan B is adopted, you have a 33% chance of getting back all $1200, and a 67% chance of getting back no money. Which plan would you use?

A3. Imagine that in one particular state it is projected that 1000 students will drop out of school during the next year. Two programs have been proposed to address this problem, but only one can be implemented. Based on other states’ experiences with the programs, estimates of the outcomes that can be expected from each program can be made. Assume for that these estimates of the outcomes are accurate and are as follows: If Program A is adopted, 400 of the 1000 students will stay in school. If Program B is adopted, there is a 40% chance that all 1000 students will stay in school and 60% chance that none of the 1000 students will stay in school. Which program would you favor for implementation?

A4. Imagine that your client has $6,000 invested in the stock market. A downturn in the economy is occurring. You have two investment strategies that you can recommend under the existing circumstances to preserve your client’s capital. If strategy A is followed, $2,000 of your client’s investment will be saved. If strategy B is followed, there is a 33% chance that the entire $6,000 will be saved, and a 67% chance that none of the principal will be saved. Which of these two strategies would you favor?

A5. Imagine a hospital is treating 32 injured soldiers, who are all expected to lose one leg. There are two doctors that can help the soldiers, but only one can be hired: If Doctor A is hired, 20 soldiers will keep both legs. If Doctor B is hired, there is a 63% chance that all soldiers keep both legs and a 37% chance that nobody will save both legs. Which doctor do you recommend?

A6. Imagine a hospital is treating 32 injured soldiers, who are all expected to lose one leg. There are two doctors that can help the soldiers, but only one can be hired: If Doctor A is hired, 12 soldiers will lose one leg. If Doctor B is hired, there is a 63% chance that nobody loses a leg and a 37% chance that all lose a leg. Which doctor do you recommend?

A7. Imagine that your client has $6,000 invested in the stock market. A downturn in the economy is occurring. You have two investment strategies that you can recommend under the existing circumstances to preserve your client’s capital. If strategy A is followed, $4,000 of your client’s investment will be lost. If strategy B is
followed, there is a 33% chance that the nothing will be lost, and a 67% chance that $6,000 will be lost. Which of these two strategies would you favor?

**A8.** Because of changes in tax laws, you may get back as much as $1200 in income tax. Your accountant has been exploring alternative ways to take advantage of this situation. He has developed two plans: If Plan A is adopted, you will lose $800 of the possible $1200. If Plan B is adopted, you have a 33% chance of losing none of the money, and a 67% chance of losing all $1200. Which plan would you use?

**A9.** Imagine that recent evidence has shown that a pesticide is threatening the lives of 1,200 endangered animals. Two response options have been suggested: If Option A is used, 600 animals will be lost for sure. If Option B is used, there is a 75% chance that 400 animals will be lost, and a 25% chance that 1,200 animals will be lost.

**A10.** Imagine that in one particular state it is projected that 1000 students will drop out of school during the next year. Two programs have been proposed to address this problem, but only one can be implemented. Based on other states’ experiences with the programs, estimates of the outcomes that can be expected from each program can be made. Assume for purposes of this decision that these estimates of the outcomes are accurate and are as follows: If Program A is adopted, 600 of the 1000 students will drop out of school. If Program B is adopted, there is a 40% chance that none of the 1000 students will drop out of school and 60% chance that all 1000 students will drop out of school. Which program would you favor for implementation?

**B. Threatening**

**B1.** Imagine that you work in a factory where recent evidence has shown that exposure to a certain cancer causing chemical is threatening the lives of 1,200 workers. Two options have been suggested: If Option A is used, 600 workers will be saved for sure. If Option B is used, there is a 75% chance that 800 workers will be saved, and a 25% chance that no workers will be saved. Which option would you recommend?

**B2.** Imagine that your doctor tells you that you have cancer that must be treated. Your choices are as follows: Surgery: Of 100 people having surgery, 90 live through the operation, and 34 are alive at the end of five years. Radiation therapy: Of 100 people having radiation therapy, all live through the treatment, and 22 are alive at the end of five years. Which treatment would you choose?

**B3.** Imagine that your home state is preparing for an outbreak of skin cancer which is expected to kill 600 senior citizens. Several members of your friends and family are at risk. Two alternative programs to combat the cancer outbreak have been proposed. If Program A is adopted, 200 people will be saved. If Program B is adopted, there is a 33% chance that 600 people will be saved, and a 67% chance that no people will be saved. Which program do you recommend to use?

**B4.** Imagine a local cancer center is treating 32 bone-cancer patients, who are all expected to lose one leg, one of which is a close friend of yours. There are two doctors that can help the patients, but only one can be hired: If Doctor A is hired, 20 patients will keep both legs. If Doctor B is hired, there is a 63% chance that all
patients keep both legs and a 37% chance that nobody will have both legs saved. Which doctor do you recommend?

B5. Imagine that it is projected that in your community 1000 patients will die during the next year from asbestos related cancer. Two programs have been proposed to address the problem, but only one can be implemented. Based on other states’ experiences with the programs, estimates of the outcomes that can be expected from each program can be made. If Program A is adopted, 400 of the 1000 patients will live. If Program B is adopted, there is a 40% chance that all 1000 patients will live and a 60% chance none of the 1000 patients will live. Which program would you recommend for implementation?

B6. Imagine that recent evidence shows that exposure to a certain cancer causing chemical is threatening the lives of 1,200 factory workers in the factory you work in. Two response options have been suggested: If Option A is used, 600 workers will be lost for sure. If Option B is used, there is a 75% chance that 400 workers will be lost, and a 25% chance that 1,200 workers will be lost. Given this information, which would you be more likely to choose?

B7. Imagine that your doctor tells you that you have cancer and it must be treated. Your choices are as follows: Surgery: Of 100 people having surgery, 10 die because of the operation, and 66 die by the end of five years. Radiation therapy: Of 100 people having radiation therapy, none die during the treatment, and 78 die by the end of five years. Given this information, which would you be more likely to choose?

B8. Imagine that Kentucky is preparing for an outbreak of skin cancer caused by environmental factors which is expected to kill 600 senior citizens. Two alternative programs to combat the cancer have been proposed. If Program A is adopted, 400 people will die. If Program B is adopted, there is a 33% chance that nobody will die, and a 67% chance that 600 people will die. You have been asked to vote on the program of your preference. Given this information, which would you recommend?

B9. Imagine a local cancer center is treating 32 bone-cancer patients, who are all expected to lose one leg. One of the patients is a long time friend of yours. There are two doctors that can help the patients, but only one can be hired: If Doctor A is hired, 12 patients will lose one leg. If Doctor B is hired, there is a 63% chance nobody loses a leg and a 37% chance that everyone will lose a leg. Given this information, which would you be more likely to recommend?

B10. Imagine that it is projected that 1000 people in your community will die during the next year from asbestos related cancer. Two programs have been proposed to address the problem, but only one can be implemented. Based on other states’ experiences with the programs, estimates of the outcomes expected from each program can be made. If Program A is adopted, 600 of the 1000 patients will die. If Program B is adopted, there is a 40% chance that none of the 1000 patients will die and a 60% chance that all 1000 patients will die. You and 50 other people have been asked to make this decision. Given this information, which would you be more likely to choose?

2. Resistance to Attribute Framing
A. Mundane

A1. Imagine the following situation. You are entertaining a special friend by inviting them for dinner. You are making your favorite lasagna dish with ground beef. Your roommate goes to the grocery store and purchases a package of ground beef for you. The label says 80% lean ground beef. What’s your evaluation of the quality of this ground beef?

A2. In a recent confidential survey completed by graduating seniors, 35% of those completing the survey stated that they had never cheated during their college career. Considering the results of the survey, how would you rate the incidence of cheating at your university?

A3. As R&D manager, one of your project teams has come to you requesting an additional $100,000 in funds for a project you instituted several months ago. The project is already behind schedule and over budget, but the team still believes it can be successfully completed. You currently have $500,000 remaining in your budget unallocated, but which must carry you for the rest of the fiscal year. Lowering the balance by an additional $100,000 might jeopardize flexibility to respond to other opportunities. Evaluating the situation, you believe there is a fair chance the project will not succeed, in which case the additional funding would be lost; if successful, however, the money would be well spent. You also noticed that of the projects undertaken by this team, 30 of the last 50 have been successful. What is the likelihood you would fund the request?

A4. Suppose a student got 90% correct in the mid-term exam and 70% correct in the final-term exam, what would be your evaluations of this student’s performance?

A5. Imagine that a woman parked illegally. After talking to her, you believe that there is a 20% chance that she did not know she parked illegally. With this in mind, how much of a fine do you believe this woman deserves?

A6. Imagine the following situation. You are having a special friend over for dinner. You are making your favorite lasagna dish with ground beef. Your roommate goes to the grocery store and purchases a package of ground beef for you. The label says 20% fat ground beef. What’s your evaluation of the quality of this ground beef?

A7. In a recent confidential survey completed by graduating seniors, 65% of those completing the survey stated that they had cheated during their college career. Considering the results of the survey, how would you rate the incidence of cheating at your university?

A8. As R&D manager, one of your project teams has come to you requesting an additional $100,000 in funds for a project you instituted several months ago. The project is already behind schedule and over budget, but the team still believes it can be successfully completed. You currently have $500,000 remaining in your budget unallocated, but which must carry you for the rest of the fiscal year. Lowering the balance by an additional $100,000 might jeopardize flexibility to respond to other opportunities. Evaluating the situation, you believe there is a fair chance the project will not succeed, in which case the additional funding would be lost; if successful, however, the money would be well spent. You also noticed that of the projects
undertaken by this team, 20 of the last 50 have been unsuccessful. What is the likelihood you would fund the request?

A9. Suppose a student got 10% incorrect in the mid-term exam and 30% incorrect in the final-term exam, what would be your evaluations of this student’s performance?

A10. Imagine that a woman parked illegally. After talking to her, you believe that there is an 80% chance that she knew she parked illegally. With this in mind, how much of a fine do you believe this woman deserves?

B. Threatening

B1. Imagine that a cigarette company claims that a certain brand of cigarette has a 95% success rate. That is, if you smoke this brand of cigarettes exclusively, there is a 95% chance that this brand of cigarettes will not give you cancer. Should the government allow this type of cigarette to be advertised as "an effective method for reducing the risk of smoking related cancer?"

B2. Imagine that a new technique has been developed for treating a particular kind of cancer. This technique has a 50% chance of success, and is available at the local hospital. A member of your immediate family is a patient at the local hospital with this kind of cancer. Would you encourage him or her to undergo treatment using this technique?

B3. Imagine that you are the head of the research and development department at a Cancer Research Institute in your community. One of your teams is requesting an extra $100,000. Their project is behind schedule and already over budget. You have $500,000 left in your budget, which must last you an additional 8 months, until the end of the year. The extra $100,000 being requested might be better spent on another project if it is not successful. You think there is a fair chance the project will not succeed, in which case the additional funding would be lost; if successful, however, the money would be well spent. Thirty of the last 50 projects undertaken by this team have been completed successfully. What is the likelihood you would fund the request?

B4. Imagine that you have been told you have lung cancer. Suppose your oncologist (cancer specialist) got 90% of his lung cancer diagnoses correct for the first six months of the year (Jan- June) and 70% of his lung cancer diagnoses correct for the final six months of the year (July-Dec), what would be your evaluations of your oncologists performance?

B5. Imagine that your close friend, a throat cancer patient, was caught illegally smoking in her hospital room. After talking to her, you believe that there is a 20% chance that she did not know that smoking in hospital rooms was against the rules. With this in mind, how much of a penalty do you think she deserves?

B6. Imagine that a cigarette company claims that a certain brand of their cigarettes has a 5% failure rate. That is, if you smoke this brand of cigarettes exclusively, there is a 5% chance that you will develop cancer. Should the government allow this type of cigarette to be advertised as "an effective method for lowering the risk of smoking related cancer?"
B7. Imagine that a new technique has been developed for treating a particular kind of cancer. This technique has a 50% chance of failure, and is available at the local hospital. A member of your immediate family is a patient at the local hospital with this kind of cancer. Would you encourage him or her to undergo treatment using this technique?

B8. Imagine that you are head of the research and development department at a Cancer Research Institute in your community. One of your teams is requesting an extra $100,000. The project is behind schedule and already over budget. You have $500,000 left in your budget, which must last you an additional 8 months, until the end of the year. The extra $100,000 being requested might be better spent on another project if it is not successful. You think there is a fair chance the project will not succeed, in which case the additional funding would be lost; if successful, however, the money would be well spent. Twenty of the last 50 projects undertaken by this team have been unsuccessful. What is the likelihood you would fund the request?

B9. Imagine that you have been told that you have lung cancer. Suppose your oncologist (cancer specialist) got 10% of his lung cancer diagnoses incorrect for the first six months of the year (January-June) and 30% of his lung cancer diagnoses incorrect for the final six months of the year (July-December), what would be your evaluations of this oncologists performance?

B10. Imagine that your close friend, a throat cancer patient, was caught illegally smoking in her hospital room. After talking to her, you believe that there is a 80% chance that she knew that smoking in hospital rooms was against the rules. With this in mind, how much of a penalty do you believe this woman deserves?

3. Resistance to Sunk Costs

A. Mundane

A1. You are buying a gold ring on layaway for someone special. It costs $200 and you have already paid $100 on it, so you owe another $100. One day, you see in the paper that a new jewelry store is selling the same ring for only $90 as a special sale, and you can pay for it using layaway. The new store is across the street from the old one. If you decide to get the ring from the new store, you will not be able to get your money back from the old store, but you would save $10 overall. Would you be more likely to continue paying at the old store or buy from the new store?

A2. You enjoy playing tennis, but you really love bowling. You just became a member of a tennis club, and of a bowling club, both at the same time. The membership to your tennis club costs $200 per year and the membership to your bowling club $50 per year. During the first week of both memberships, you develop an elbow injury. It is painful to play either tennis or bowling. Your doctor tells you that the pain will continue for about a year. Would you be more likely to play tennis or bowling in the next six months?

A3. You have been looking forward to this year’s Halloween party. You have the right cape, the right wig, and the right hat. All week, you have been trying to perfect the outfit by cutting out a large number of tiny stars to glue to the cape and the hat, and you still need to glue them on. On the day of Halloween, you decide that the
outfit looks better without all these stars you have worked so hard on. Would you be more likely to wear the stars or go without?

A4. After a large meal at a restaurant, you order a big dessert with chocolate and ice cream. After a few bites you find you are full and you would rather not eat any more of it. Would you be more likely to eat more or to stop eating it?

A5. You are in a hotel room for one night and you have paid $6.95 to watch a movie on pay TV. Then you discover that there is a movie you would much rather like to see on one of the free cable TV channels. You only have time to watch one of the two movies. Would you be more likely to watch the movie on pay TV or on the free cable channel?

A6. You have been asked to give a toast at your friend’s wedding. You have worked for hours on this one story about you and your friend taking drivers’ education, but you still have some work to do on it. Then you realize that you could finish writing the speech faster if you start over and tell the funnier story about the dance lessons you took together. Would you be more likely to finish the toast about driving or rewrite it to be about dancing?

A7. You decide to learn to play a musical instrument. After you buy an expensive cello, you find you are no longer interested. Your neighbor is moving and you are excited that she is leaving you her old guitar, for free. You’d like to learn how to

A8. You and your friend are at a movie theater together. Both you and your friend are getting bored with the storyline. You’d hate to waste the money spent on the ticket, but you both feel that you would have a better time at the coffee shop next door. You could sneak out without other people noticing. Would you be more likely to stay or to leave?

A9. You and your friend have driven halfway to a resort. Both you and your friend feel sick. You both feel that you both would have a much better weekend at home. Your friend says it is “too bad” you already drove halfway, because you both would much rather spend the time at home. You agree. Would you be more likely to drive on or turn back?

A10. You are painting your bedroom with a sponge pattern in your favorite color. It takes a long time to do. After you finish two of the four walls, you realize you would have preferred the solid color instead of the sponge pattern. You have enough paint left over to redo the entire room in the solid color. It would take you the same amount of time as finishing the sponge pattern on the two walls you have left. Would you be more likely to finish the sponge pattern or to redo the room in the solid color?

B. Threatening

B1. Imagine that you are in the process of receiving chemotherapy. It costs $2000 and you have already paid $1000 towards the cost, so you owe another $1000. Your best friend’s oncologist says that she can provide the therapy for only $900. If you decide to get the therapy from the new oncologist, you will not be able to get your money back from the old one, but you would save $100 overall. Would you be more likely to continue paying for the current therapy or to buy the new one?
B2. Imagine that you enjoy smoking cigars, but you really enjoy drinking wine. You just joined cigar and wine of the month clubs at the same time. The membership to your wine of the month club costs $100 per year and the membership to your cigar of the month $400 per year. During the first week of both memberships, you develop a potentially cancerous cyst in your stomach making smoking and drinking dangerous. Your doctor tells you to stop smoking and drinking until the cyst is removed and healed which could take a year. Would you be more likely to smoke a cigar or have a glass of wine in the next six months?

B3. Imagine that you are a smoker with a family history of lung cancer. You are attending a 12 week seminar designed to help you quit smoking. The seminar is taking up a lot of your energy and free time. In order to be covered by insurance, you must attend all 12 weeks of the seminar. You are making great progress and feel that soon you will be 100% smoke-free. After the eighth week, you realize that you are able to quit the program without penalty and receive full coverage from your insurance. Would you be more likely to finish the seminar or quit?

B4. Imagine that despite your ongoing battle with cancer and corresponding chemotherapy, you and your spouse decide to celebrate your birthday at your favorite restaurant. After eating a large meal, you order a big dessert with chocolate and ice cream. Due to the side effects of your chemotherapy, after a few bites you find you are full and would rather not eat any more. Would you be more likely to eat more or to stop eating it?

B5. Imagine you are currently between jobs and temporarily uninsured. Concerned about prostate/breast cancer, you register for a $95 exam being held at the local health clinic in two weeks. In the meantime, you learn that the National Cancer Institute is hosting an event tomorrow afternoon administering free cancer screenings to all attendees. Your $95 is non-refundable. Where would you be more likely to go to?

B6. Imagine that after several months of chemotherapy, you read an article that leads you to believe that making a switch to radiation therapy may be more comfortable in the short term. After reading the article you find yourself seriously considering discontinuing chemotherapy in favor of radiation. Would you be more likely to continue chemotherapy or start radiation?

B7. Imagine that you are scheduled to have a colonoscopy. Before the procedure, you must cleanse your bowels. To do so, you have to drink 8 ounces of “Golytely” every half hour, for 4 hours (total of 64 oz.). This drink causes violent vomiting and diarrhea for the 4 hours you are drinking it. You purchase the Golytely for $40. After drinking for 1 hour, you call your doctor to see if there is anything you can take to minimize the symptoms, which are causing you significant discomfort. He offers you an anti-nausea prescription that will help control the vomiting and diarrhea for the remaining 3 hours. The drug will cost an additional $40. What would you be most likely to do?

B8. Imagine that to fight the nausea caused by your daily chemotherapy treatments, your physician prescribes a medication to combat the negative side effect, but it may take some time to work. The medication is expensive, and must be paid for out of pocket, but you decide it is worth the money to feel better. After two weeks, you are
convinced that the medication is actually making you more nauseous. You hate to waste the money you spent on 3 months’ worth of the medication, but you know that you would feel better if you stopped taking it. What would you be most likely to do?

B9. Imagine that despite your concern about sun exposure (because of your spouse’s family history of skin cancer) you and your spouse decide to take a vacation to the Bahamas. You book the trip for $3000. A week before you’re supposed to leave, your family physician discovers a series of moles on your spouse’s face and does a biopsy. The test result will take two weeks. Your physician advises you to avoid direct contact with the sun for the next two weeks until the biopsy results are back. You begin to wonder if cancelling your vacation might be a smart option, despite the fact that it is nonrefundable. Would you be more likely to go to the Bahamas or cancel the trip?

B10. Imagine that you are an oncologist who specializes in breast cancer at a respected cancer treatment center. You start a patient, who is sick with cancer, on treatment A, which is a lengthy treatment process. After completing 50% of the treatment, you realize that treatment B may be the best option. It is not too late to change treatment plans, and doing so would take the same amount of time as finishing treatment A. Would you be more likely to finish treatment A or to discontinue treatment A in favor of treatment B?

4. Under/Overconfidence

A. Mundane

A1. You can take wrinkles out of your clothes by putting them in the dryer with a damp towel.

A2. After a fight with your partner, you should not focus on who was to blame.

A3. The grace period on your credit card is the amount of time you do not have to pay interest on outstanding payments.

A4. Red wine stains are easier to remove than beer stains.

A5. Problems with in-laws contribute to more than 30% of divorces.

A6. IRS forms are available on-line.

A7. A venture capital fund invests in new businesses by providing startup capital.

A8. It is wise to handle all negotiations yourself, even if your opponent uses a lawyer.

A9. There are nonprofit organizations that help people with debt counseling.

A10. Assertive behavior makes your brain experience an increase in pleasure.

A11. Credit card companies can offer lower payments if you can come up with a lump sum settlement.

A12. Self-employed people pay the same amount of taxes as people who work for an employer.

A13. When buying a new home, there is little need to have it inspected before you buy it.
A14. Creating a routine is an important step in getting unpleasant work done.
A15. If you get into an auto accident, let the other person take the lead in handling the details.
A16. There is no way you can negotiate a lower rate with a credit card company.

B. Threatening
B1. “Light” cigarettes are less likely to cause cancer than regular cigarettes.
B2. Women who have abortions are at increased risk of developing breast cancer later in life.
B3. Artificial sweeteners like aspartame are associated with increased cancer risk in the U.S.
B4. Smokers exposed to asbestos are at an increased risk of developing lung cancer.
B5. Cancer that starts in the bone is the most common form of cancer in American adults.
B6. Cancer is the second leading cause of death in the United States.
B7. Cancer can be caused by genetics, lifestyle, and environmental factors.
B8. About 64% of all people diagnosed with cancer will be alive 5 years later.
B9. The most common risk factor associated with prostate cancer is high blood pressure.
B10. Prostate cancer can only be positively diagnosed following a biopsy.
B11. Bone cancer is very rare, accounting for roughly 1% of all new cancer diagnoses per year.
B12. A Cancer Institute estimates that 35% of women born today will be diagnosed with breast cancer at some point in their lives.
B13. There is no vaccine that guarantees a cancer-free life.
B14. Tobacco and alcohol use are the most important risk factors for developing head and neck cancers.
B15. Breast cancer is the leading cause of cancer death in U.S. women.
B16. Smokeless tobacco is a safe substitute for cigarettes and reduces the odds of cancer.
APPENDIX C: DISSERTATION QUESTIONNAIRE MEASURES
1. **Self-Esteem**
   A. I feel that I'm a person of worth, at least on an equal plane with others.
   B. I feel that I have a number of good qualities.
   C. All in all, I am inclined to feel that I am a failure.
   D. I am able to do things as well as most other people.
   E. I feel I do not have much to be proud of.
   F. I have a positive attitude toward myself.
   G. On the whole, I am satisfied with myself.
   H. I wish I could have more respect for myself.
   I. I certainly feel useless at times.
   J. At times I think I am no good at all.

2. **Future Time Perspective**
   A. I follow the advice to save for a rainy day.
   B. I enjoy thinking about how I will live years from now in the future.
   C. The distant future is too uncertain to plan for.
   D. The future seems very vague and uncertain to me.
   E. I pretty much live on a day-to-day basis.
   F. I enjoy living for the moment and not knowing what tomorrow will bring

3. **Subjective Appraisal of Decision Making Competence**
   A. What percent of other people do you think are better decision makers than you?

4. **Psycho-social Balance (Integrity versus Despair)**
   A. Having friends is important to me.
   B. I have confidence in my own abilities.
   C. If I could relive my life, I would make few changes.
   D. My religious/spiritual beliefs are stronger now than ever.
   E. You can break a person physically, but you can never take away their human dignity.
   F. Life has been good to me.
   G. I have left my mark on the world.
   H. There are things I enjoy in life.
   I. I find little sense in living.
J. If I had courage I would end my life.
K. I know what it means to have a strong sense of self.
L. When I die, I will be missed.
M. I have given serious thought to the meaning of life.
N. When one is old it makes no sense to start new hobbies or activities.
O. I keep physically active, within my body limits.

5. Risk Tolerance
   A. I prefer a “sure thing” over a gamble.
   B. Being overly cautious leads to boredom.
   C. When it comes to making decisions about my health and well-being, I am unwilling to take risks.
   D. A certain amount of risk is necessary to lead a full, happy, and healthy life.
   E. I take preventative measures to avoid any negative health consequences.
   F. It is ok to reduce the amount of medication you take as long as you are feeling ok even if you have not discussed it with your doctor.
   G. I avoid activities that present a danger to my health and well-being.
   H. Not following your doctor’s orders is playing with fire.
   I. Taking chances such as not eating well, smoking, and not exercising are okay as long as they are done in moderation.
   J. My health is very valuable to me and I would not do anything to jeopardize it.

6. Self-Rated Affect
   A. How often do you generally feel upset?
   B. How often do you generally feel hostile?
   C. How often do you generally feel alert?
   D. How often do you generally feel ashamed?
   E. How often do you generally feel inspired?
   F. How often do you generally feel nervous?
   G. How often do you generally feel determined?
   H. How often do you generally feel attentive?
   I. How often do you generally feel afraid?
   J. How often do you generally feel active?
7. Maximizing Tendency
   A. No matter what, I always try to choose the best thing.
   B. I don’t like having to settle for “good enough.”
   C. I am someone who tends to expend maximum energy in order to make the best decision.
   D. No matter what I do, I have the highest standards for myself.
   E. I will wait for the best option, no matter how long it takes.
   F. I never settle for second best.
   G. I am uncomfortable making decisions before I know all of my options.
   H. When faced with a choice, I try to imagine all of possibilities, even those that aren’t present at the time.
   I. I never settle.
   J. When making a decision I prefer to examine each option one at a time.
   K. When making a decision I tend to compare the available options based on characteristics that are important to me.

8. Preferences for Collaborative Decision Making
   A. Scenario #1: Because all other treatment options have been tried and failed, it is time that you consider an experimental cancer treatment, the side effects of which are largely unknown……..
   i. Who do/would you like to collaborate with when making a decision like this? (check all that apply)
      1. Spouse/ significant other
      2. Expert such as your health care provider
      3. Son/daughter/ grandchild
      4. Parent
      5. Sibling or other relative
      6. Close Friend
      7. No one
      8. Other ____________________
   ii. When making decisions like this, how much control do you prefer to have over the decision?
      1. I prefer to make the decision on my own.
      2. I prefer to make the decision after considering someone else’s opinion.
      3. I prefer to share the decision with someone else.
      4. I prefer that someone else make the decision after considering my opinion.
      5. I prefer to allow someone else to make the decision for me.
iii. How often do you/would you collaborate with others to make a decision like this?
   1. Never
   2. Hardly Ever
   3. Sometimes
   4. Nearly Always
   5. Always

B. Scenario #2: You have decided to purchase a new vehicle……

i. Who do/would you like to collaborate with when making a decision like this? (check all that apply)
   1. Spouse/ significant other
   2. Expert such as your mechanic
   3. Son/daughter/ grandchild
   4. Parent
   5. Sibling or other relative
   6. Close Friend
   7. No one
   8. Other ______________________

ii. When making decisions like this, how much control do you prefer to have over the decision?
   1. I prefer to make the decision on my own.
   2. I prefer to make the decision after considering someone else’s opinion.
   3. I prefer to share the decision with someone else.
   4. I prefer that someone else make the decision after considering my opinion.
   5. I prefer to allow someone else to make the decision for me.

iii. How often do you/would you collaborate with others to make a decision like this?
   1. Never
   2. Hardly Ever
   3. Sometimes
   4. Nearly Always
   5. Always

C. Scenario #3: You have decided to add to your current retirement plan……

i. Who do/would you like to collaborate with when making a decision like this? (check all that apply)
   1. Spouse/ significant other
   2. Expert such as a financial planner
   3. Son/daughter/ grandchild
   4. Parent
   5. Sibling or other relative
   6. Close Friend
7. No one
8. Other ______________________

ii. When making decisions like this, how much control do you prefer to have over the decision?
   1. I prefer to make the decision on my own.
   2. I prefer to make the decision after considering someone else’s opinion.
   3. I prefer to share the decision with someone else.
   4. I prefer that someone else make the decision after considering my opinion.
   5. I prefer to allow someone else to make the decision for me.

iii. How often do you/would you collaborate with others to make a decision like this?
   1. Never
   2. Hardly Ever
   3. Sometimes
   4. Nearly Always
   5. Always

9. Demographics and Cancer Experience
   A. Age _______
   B. Gender:
      i. Male
      ii. Female
   C. Highest Educational Level Achieved:
      i. Less than 12 years education
      ii. High school diploma or equivalent
      iii. Some college/Associates
      iv. B.A. or B.S. degree
      v. Graduate degree (e.g. Master’s; Ph.D.)
      vi. Other, specify____________________
   D. Racial Background:
      i. Caucasian
      ii. African American
      iii. Native American/Pacific Islander
      iv. Asian
      v. Multiracial
      vi. Other (please specify)_______________
   E. Ethnic Background:
      i. Hispanic
      ii. Not Hispanic
   F. Marital Status:
      i. Single
ii. Married
iii. Divorced
iv. Separated
v. Widowed

G. Current Household Income:
   i. Below $15,000
   ii. $15,001-$35,000
   iii. $35,001-$55,000
   iv. $55,001-$75,000
   v. $75,001 +

H. In general, would you say your health is
   i. Poor
   ii. Fair
   iii. Good
   iv. Very Good
   v. Excellent

I. Who lives with you? Please check all that apply.
   i. No one
   ii. Spouse or significant other
   iii. Your children
   iv. Others ____________________

J. Can you see well enough to read ordinary newspaper print?
   i. No
   ii. Yes
   iii. Yes, but only with reading glasses

K. Can you hear well enough to carry out a normal conversation in a crowded setting?
   i. No
   ii. Yes
   iii. Yes, but only with a hearing aid

L. Have you ever been diagnosed with cancer?
   i. No
   ii. Yes
   iii. If so, what kind? ______________________________

M. Has anyone in your immediate family ever been diagnosed with cancer?
   i. No
   ii. Yes
   iii. If so, what kind? ______________________________

N. Have any of your close friends or relatives other than immediate family ever been diagnosed with cancer?
   i. No
   ii. Yes
   iii. If so, what kind? ______________________________
APPENDIX D: STUDY COVER LETTER/DESCRIPTION
Greetings!

Thank you for volunteering to participate in our study on adult decision making competence and preferences for collaborative decision making. Christopher C. Gayer a graduate student in the Graduate Center for Gerontology and Joy M. Jacobs-Lawson, PhD, are conducting this study. Enclosed you will find a pre-addressed stamped envelope and a copy of the survey. Please make your best effort to complete and return the enclosed survey within two weeks.

The purpose of this study is to examine adult decision making competence and preferences for collaborative decision making. You are being invited to take part in this study because you are an individual between the ages of 55 and 90. The study involves completing the enclosed questionnaire. The questions on the questionnaire will ask you a series of hypothetical questions in which you are asked to make a variety of different types of decisions. In addition, there are questions about you, such as your age, marital status, and how you approach life. It will take about 30 to 45 minutes to complete.

Your participation in the study is voluntary and you may skip any questions that you prefer not to answer. All research records will be kept private and confidential. We ask that you return the completed questionnaire in the provided preaddressed envelope without adding your address or name to the envelope or questionnaire. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. If you would rather not complete the questionnaire, please return it blank in the provided envelope.

If you have questions about the study, you can contact the investigators, Christopher C. Gayer at 859-257-1450, extension 80179 or christophergayer@uky.edu and Joy M. Jacobs-Lawson at 859-257-1450, extension 80194 or Joy.Jacobs-lawson@uky.edu. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll free at 1-866-400-9428. You should keep this page for your records.

Again, please make your best effort to complete and return the enclosed survey within two weeks, and thanks again for your willingness to participate.

Sincerely,

Christopher C Gayer
REFERENCES


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Lichtenstein, S., & Fischhoff, B. (1977). Do those who know more also know more about how much they know? Organizational Behavior and Human Performance, 20, 159-183.


Vita
Christopher C. Gayer

Educational Background

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<th>Institution</th>
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<td>University of Kentucky</td>
<td>Gerontology</td>
<td>Ph.D.</td>
<td>05/2013 (exp.)</td>
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<td>Penn State University</td>
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<td>B.S.</td>
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Work/ Research Experience

2012-present  Research Manager, Cancer Support Community
Research and Training Institute
Joanne Buzaglo, PhD, Supervisor
Philadelphia, PA

2008-2012  Graduate Research Assistant, Graduate Center for Gerontology
Aging, Decision Making, and Planning Laboratory,
Joy M. Jacobs-Lawson, PhD, Faculty Supervisor
University of Kentucky

2006-2008  Undergrad. Research Assistant, Human Development and Family Studies
Adaptive Interventions for At Risk Caregivers,
Steven H. Zarit, PhD, Faculty Supervisor
Pennsylvania State University

Teaching Experience

Spring 2010  Instructor, *Introduction to Aging Studies: Perspectives and Issues*
College of Public Health
University of Kentucky

Spring 2008  Teaching Assistant, *Family Relationships: Evolutionary Psychology*
College of Health and Human Development
Pennsylvania State University
Peer Reviewed Publications


Manuscripts Submitted or Under Revision


Presentations


**Professional Memberships, Honors, and Awards**

Fall 2011, National Institute on Aging- Grants Technical Assistance Workshop Selectee
2008-2012, Research Challenge Trust Fellowship

2009; 2010 Graduate School Conference Student Support Award

Spring 2009, Gerontological Society of America Reviewer-in-Training

Spring 2007, Kappa Omicron Nu Induction

Spring 2007, Omicron Delta Kappa Induction