THE EFFECTS OF MAGNITUDE AND LIKELIHOOD ON INFORMATION AVOIDANCE

By

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To my husband, Andy

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A number of factors may influence a person's decision to seek vs. avoid information. The goal this dissertation was to explore how two factors, magnitude (severity of medical condition) and likelihood (probability of having medical condition), influence decisions to seek vs. avoid diagnostic testing. The author hypothesized that the inclusion of two additional variables, ease of test access and control over developing the condition, were necessary to fully understand the relationships between magnitude, likelihood, and information avoidance. In two experiments, the author examined the extent to which magnitude, likelihood, ease (Study 1), and control (Study 2) predicted the decision to seek vs. avoid diagnostic testing for TAA deficiency (a fictitious medical condition). In Study 1, the author hypothesized that participants would display the most avoidance when magnitude was low, likelihood was low, and ease was low and the least avoidance when magnitude was low, likelihood was low, and ease was high. Results did not support the Study 1 hypotheses. Instead, results revealed two significant main effects. Participants (N = 177) were significantly more likely to avoid diagnostic testing when 1) likelihood was low rather than high and, 2) ease was high rather than low. In Study 2, the author hypothesized that participants would display the most

avoidance when magnitude was high, likelihood was high, and control was low and the least avoidance when magnitude was high, likelihood was high, and control was high. Results did not support the Study 2 hypothesis. Results revealed two significant main effects. Participants (*N* = 179) were significantly more likely to avoid diagnostic testing when 1) likelihood was low rather than high and, 2) magnitude was low rather than high. Taken together, these findings reveal that likelihood and ease predict avoidance, such that low likelihood and low ease corresponded with greater avoidance. However, the relationship between magnitude and avoidance was inconsistent, such that low magnitude corresponded with greater avoidance in Study 2 but did not predict avoidance in Study 1. Further, control did not predict avoidance. Future research is needed to understand the role of magnitude and control in avoidance decisions.

CHAPTER 1
INTRODUCTION

Magnitude and Likelihood

Imagine a woman at her local pharmacy. She notices the machine that provides free blood pressure readings, but feels unsure about whether she should take the test. On the one hand, she believes that she should take the test because it is free and quick. Further, she realizes that hypertension is a serious medical condition. On the other hand, she believes that she should avoid the test because her blood pressure was high at her last doctor's appointment. Further, she has not monitored her diet as directed by her doctor and she worries the news might be bad. Will she choose to get the screening?

The proposed example examines the decision to seek vs. avoid potentially unwanted information. A number of factors may influence a person's decision to seek vs. avoid information. Two factors that are particularly relevant are the magnitude of the consequences of the information (i.e., magnitude) and the likelihood that the consequences will be experienced (i.e., likelihood).

What is Information Avoidance?

Information avoidance is "any behavior designed to prevent or delay the acquisition of available but potentially unwanted knowledge" (Sweeny, Melnyk, Malone, & Shepperd, 2010). Information avoidance may be temporary or permanent. Delaying reading a potentially unpleasant email reflects temporary information avoidance; never reading that the email reflects permanent avoidance. The information need not be unpleasant. People may avoid pleasant information such as the sex of an unborn child (Shipp et al., 2004).

Information avoidance bears some similarity to selective exposure. Selective exposure, also called the congeniality bias, is the tendency for people to seek information consistent with their beliefs, attitudes, and past decisions, and avoid

inconsistent information (Hart et al., 2008). Thus, consistency is the underlying motive behind selective exposure. Similar to information avoidance, research on selective exposure addresses why people seek or avoid information and what factors influence their decision. However, research on selective exposure is narrower because it primarily focuses on what people do when they must choose between two types of information – information consistent or inconsistent with their attitudes, beliefs and prior decisions (Mills, Aronson, & Robinson, 1959). Information avoidance is broader in that it looks at the decision to seek vs. avoid information, rather than at the preference for consonant information over inconsonant information.

Exploring Magnitude and Likelihood

A variety of factors could influence the decision to seek vs. avoid information. Two factors featured prominently in prior research on decision making are severity and likelihood. For example, judgments of severity and likelihood influence people's willingness to take risks (e.g., gambling; Harris, Jenkins, & Glaser, 2006), comply with hazard warnings (Wogalter, Young, Brelsford, & Barlow, 1999), and engage in preventative health behaviors (Janz & Becker, 1984; Milne, Sheeran, Orbell, 2000; Floyd, Prentice-Dunn, & Rogers, 2000). In each of these domains people are relying on perceived severity (comparable to our variable of magnitude) and likelihood in deciding a course of action when an outcome is unknown. Thus, severity and likelihood likely play an important role in the decision to seek vs. avoid information.

Research on predictors of information avoidance is limited. The most pertinent research comes from the research on models of how people make decisions in health domains (e.g., health belief model, protection motivation theory). These health models are relevant because severity and likelihood play a central role and because, the proposed research, similar to the health models, addresses decision making in health

domains. Importantly, these health models are primarily interested in intentions to engage in preventative behavior rather than the decision to seek vs. avoids information. Nevertheless, the decision to seek vs. avoid information, similar to the decision to pursue a particular behavior (i.e., behavior intentions) reflects a complex decision that is influenced by multiple factors, involves weighing considerations of costs and benefit of a decision, and may entail taking actions the person would rather not take.

Magnitude

Magnitude refers to the magnitude of the implications or consequences of information. For example, a student deciding whether to look at an exam grade online might consider whether the grade is for small quiz vs. a final exam. The consequences of earning a low grade on a small quiz are smaller than are the consequences for earning a low grade on a final exam. Although magnitude is similar to the construct “severity” they are not synonymous. Severity is relevant to only negative outcomes whereas magnitude is relevant to both positive and negative information. For example, in both the health belief model and protection motivation theory, severity refers to the seriousness of a disease. Because the goal of the current investigation is to examine the predictors of the decision to seek or avoid diagnostic medical testing (i.e., potentially negative information), the meanings of magnitude and severity are somewhat similar in this study. For ease of presentation, I will use the term severity in discussing past research and magnitude when discussing my research.

Severity is featured prominently in both the health belief model and protection motivation theory. Both theories predict that perceptions of greater severity are associated with greater intentions to engage in preventative behavior. However, research examining the effects of severity within the context of the health models reveals mixed results. Meta-analyses find that severity is related to intentions to engage in

preventative behavior in some studies, but not in others (Janz & Becker, 1984; Milne, Sheeran, Orbell, 2000; Floyd, Prentice-Dunn, & Rogers, 2000). For example, one study found that greater perceptions of the seriousness of Hepatitis-B were associated with a greater likelihood of completing the Hepatitis-B shot regimen (de Wit, Vet, Schutten, & van Steengergen, 2005). However, other research finds that severity is not influential in the decision to engage in preventative health behavior. For example, the perceived severity of having cervical cancer did not predict whether women received a cervical cancer screening (Allahverdipour & Emami, 2008).

Information Avoidance and Severity

Results regarding the effects of severity on information avoidance are also mixed. Some studies find that greater perceptions of severity are associated with *less* information avoidance. For example, one study examined participants' interest in learning about the detrimental effects of florescent lighting on academic performance in which the effects were portrayed as severe (exposure to florescent lighting would lower their grade by one letter grade per semester) or not severe (exposure lower their grade by one half of one point in a course). Participants were more likely to seek information about the hazards of florescent lighting in the high severity condition than in the low severity condition (Neuwirth, Dunwoody, & Griffin, 2000). Similar results emerged in a study examining participants' testing decision for a fictitious enzyme deficiency called TAA (Dawson, Savitsky, & Dunning, 2006). Participants in the mild severity condition were told that TAA has no unpleasant symptoms, and those in the high severity were told that TAA is very serious and puts them at elevated risk for pancreatic disorders. Participants were more likely to seek testing for the enzyme deficiency in the high severity condition than in the mild severity condition. Thus, in both studies higher severity was associated with greater information seeking (i.e., less avoidance).

However, other studies find that higher severity is associated with greater information avoidance. For example, participants facing the decision to seek or avoid testing for genetic hair loss in which the consequences were severe (i.e., dramatic decrease in rate of new hair production and noticeable hair loss beginning in the late 20s) or not severe (i.e., slight and unnoticeable decrease in new hair production), were more likely to avoid genetic testing when the consequences of the condition was severe than when it was not severe (Dawson, Savitsky, & Dunning, 2006). In another study, researchers examined reasons to avoid genetic testing for Huntington's disease among people at 50% risk for the condition. Compared with participants who sought testing, participants who avoided testing indicated significantly greater consequences of learning of a positive test result. Specifically, avoiders anticipated more difficulties in families and an overall lower quality of life (van der Steenstraten, Tibben, Roos, van de Kamp, & Niermeijer, 1994).

Likelihood

Likelihood, also called susceptibility or vulnerability, refers to the probability that the consequences of the information will be experienced. Similar to severity, likelihood is featured prominently in both the health belief model and protection motivation theory. According to both theories, greater perceptions of likelihood are associated with greater intentions to engage in preventative behaviors. In other words, people are more likely to intend to, and engage in, preventative behavior to the extent that they feel vulnerable to the relevant health threat.

Also similar to the results regarding the effects of severity, the results on the relationship between likelihood and engagement in preventative behaviors is mixed. Meta-analyses find that likelihood is related to intentions to engage in preventative behavior in some studies, but not in others (Janz & Becker, 1984; Milne, Sheeran,

Orbell, 2000; Floyd, Prentice-Dunn, & Rogers, 2000). In some cases, greater perception of likelihood is associated with greater engagement in preventative behaviors. For example, gay men who indicated that they were more at risk of contracting Hepatitis-B were more likely to complete a Hepatitis-B shot regimen (de Wit, Vet, Schutten, & van Steengergen, 2005). However, sometimes greater perception of likelihood is associated with *less* engagement in risk behavior. For example, mothers who perceived that their children were more likely to get sick were less likely to bring their children in for routine, preventative doctor visits (Becker, Nathanson, Drachman, & Kirscht, 1977). Finally, sometimes likelihood fails to predict engagement in preventative behaviors. For example, perceived vulnerability to osteoporosis in one study did not predict intentions to consume calcium or engage in weight baring exercise (Schmiege, Aiken, Sander, & Gerend, 2007).

Information Avoidance and Likelihood

Although few studies have examined the effects of likelihood perceptions on information avoidance, the evidence suggests that lower perceptions of likelihood are associated with greater information avoidance. In one study, researchers examined willingness to take a genetic test for Huntington's disease (HD) among people at risk for HD (Babul et al., 1993). People at higher risk for HD (based on previous testing) were more interested in seeking the results of a new genetic test for HD compared with people at less risk for HD and to those unaware of their level of risk. In other words, participants were more likely to decline genetic screening if their risk was low or they were unaware of their risk. Similarly, researchers found that as the number of first degree relatives with breast cancer increases, so too does likelihood of seeking testing for the BRCA1 gene (Lerman et al.,1996). Again, participants who perceived that they were less at risk for developing the disease were more likely to decline testing.

Why are the Effects of Magnitude and Likelihood on Behavior Inconsistent?

The effect of magnitude and likelihood on health behavior are weak at best and inconsistent at worst (Floyd et al., 2000; Janz & Becker, 1984; Milne et al., 2000). Researchers have proposed several explanations for the weak and inconsistent relationships between magnitude, likelihood, and health behavior.

First, traditional measures of likelihood may be problematic. Likelihood is often measured as the chance that one will contract a disease (Rosenstock, 1966). Some researchers have argued that this traditional measurement is not effective and instead suggest a conditional measure of likelihood (see Ronis, 1992). In other words, participants are asked the likelihood that they will contract a disease if they engage or do not engage in preventative behavior. Consistent with his prediction, studies have often achieved greater success in predicting intentions using statements of conditional likelihood (e.g., “Considering all of the different factors that may contribute to AIDS, including your own past and present behavior, what would you say are your chances of getting AIDS?”; Aspinwall et al., 1991). Although this type of conditional likelihood statement is more effective than traditional measures of likelihood, this example of a conditional statement is rather general. A stronger conditional statement may be, “If you use regularly use condoms, what are your chances of getting AIDS?”

Second, magnitude and likelihood are often confounded in the minds of participants. Although most combinations of magnitude and likelihood are not problematic, the combination of high magnitude and high likelihood can be problematic. For example, people have difficulty imagining a disease that is both severe and common. Instead, people appear to have a heuristic that severe diseases are rare, and researchers find that participants rate a disease as more severe when it is described as rare than when it is described as common (Jemmott, Ditto, & Croyle, 1986). Thus,

participants within the same level of magnitude may interpret the severity information differently depending on their perceived likelihood of having the condition.

Third, traditional measures of severity may be problematic. Severity is a multidimensional construct and some operations of severity may be more effective than others (Milne, et al., 2000). For example, human immunodeficiency virus (HIV) is more deadly and thus an objectively more serious type of a sexually transmitted disease than is chlamydia. Thus, one way to manipulate severity is to select diseases that vary in severity. Another potential way to manipulate severity is through the description of the treatment for the condition. Again, the researcher could describe treatment for HIV as requiring a much greater change in behavior (e.g., long-term drug therapy) than the treatment for chlamydia (e.g., brief course of antibiotics). Severity can also vary in terms of onset of the disease (near vs. distant), the speed of onset (gradual vs. sudden), and the visibility of symptoms (low vs. high; Smith-Klohn & Rogers, 1991).

Next, weak associations between magnitude and likelihood with intentions to engage in preventative behaviors may occur because researchers have omitted important individual difference variables. Two individual difference variables that may play an important role in information avoidance are uncertainty orientation and dispositional optimism.

People vary in the extent to which they like to learn new things about themselves and their environment (Sorrentino & Short, 1986). Uncertainty-oriented people like to learn new things about themselves and their environment and seek to gain an accurate view of both. Certainty-oriented people prefer to seek information that maintains their current view of themselves and their environment. Researchers find that uncertainty motivation moderates the impact of perceived threat (a variable that combined magnitude and likelihood) on willingness to get tested for a fictitious disease (Crevelling's

disease; Brouwers & Sorrentino, 1993). Uncertainty-oriented participants were more likely to seek testing for the fictitious disease when threat was high and the test was described as highly diagnostic. Although the test would likely reveal unpleasant information, uncertainty-oriented participants sought the information because they prefer to have an accurate view of themselves and their environment. Certainty-oriented participants were more likely to seek testing when threat was high *or* diagnosticity was high, but not when both were high. If only one of the variables (threat or diagnosticity) is high, certainty-oriented participants can maintain their view of themselves and their environment because: a) seeking a test result is not threatening if they are at high risk, but the test itself is not very diagnostic; and b) seeking a test result is not very threatening if the test is diagnostic but they are at a low risk for the disease.

People also vary in the extent to which they believe good things will happen in the future. Dispositional optimists believe that good things will happen and negative events will be scarce (Scheier & Carver, 1985). On the other hand, dispositional pessimists believe bad things will happen and good things will be scarce. Dispositional optimists are more likely (than dispositional pessimists) to believe that unknown information will be positive (Geers, 2000; Scheier & Carver, 1985). How will optimism influence the decision to seek or avoid information? One study that examined willingness to be tested for the hereditary breast cancer found that women were more likely to avoid testing if they were dispositionally optimistic than if they were dispositionally pessimistic (Biesecker et al., 2000). The authors proposed two possible explanations for the effect. First, dispositional optimists may overestimate the probability that they did not inherit breast cancer or they may underestimate the chance that they will develop breast cancer if they did inherit the breast cancer gene. This explanation is consistent with dispositional optimists' general tendency to think good things will happen to them. Second, dispositional optimists are

more likely to take risks (Norem & Cantor, 1986). Avoiding potentially important health information represents a type of risky behavior.

Finally, difficulties in finding effects of magnitude and likelihood may occur because important situational variables were not examined in previous studies. Two likely variables are ease of information attainment and perceived control. Ease of information attainment simply refers to the ease with which one can acquire information. Ease in the current investigation is akin to the variable cost as it is defined in both the health belief model and protection motivation theory. In both frameworks, “costs” refers to both monetary and non-monetary costs (e.g., time). Further, both theories predict that greater perceptions of cost are associated with less intention to engage in preventative behavior. Meta-analyses of the PMT confirm this prediction and find that cost is the variable most strongly associated with behavioral outcomes (i.e., relative to the other PMT variables; Milne et al., 2000). However, ease is often not tested when researchers explore potential interactions among the protection motivation theory variables (Block & Keller, 1998; Neuwirth, Dunwoody, & Griffin, 2000). Thus, testing the role of ease in conjunction with magnitude and likelihood is needed to understand the effects of magnitude and likelihood on behavior.

A second potential situational predictor is perceived control. According to protection motivation theorists, perceived control is divided in two components: response efficacy (i.e., the belief that adaptive behavior will produce the desired outcome) and self-efficacy (i.e., the belief that one has the skills to engage in the adaptive behavior; Rogers, 1983). Prior studies have shown that magnitude, likelihood, and self-efficacy interact (Block & Keller, 1998), and that magnitude, likelihood, and response efficacy interact (Neuwirth, Dunwoody, & Griffin, 2000) in predicting intentions to engage in health behaviors. In both studies, intentions to engage in health behavior were greatest when magnitude,

likelihood, and control were all high. Thus, previous research examining intentions to engage in preventative behaviors suggests that magnitude, likelihood, and control will likely interact to predict information avoidance. Consistent with this prediction, researchers have shown that participants are more likely to seek testing regarding a medical condition when they believed the condition is severe and treatable, but are more likely to avoid testing when they believed the disease is severe and *un*treatable (Dawson, Savitsky, & Dunning, 2006). Thus, participants sought information when the disease was severe, but only when treatment was available.

In summary, effects of magnitude and likelihood on preventative behavior were likely mixed in prior studies because of problems with measurement of these variables, i.e., likelihood was not made conditional on behavior, magnitude and likelihood were confounded in the minds of participants, and the selected dimension of magnitude was less effective. In addition, potentially important individual difference variables (i.e., dispositional optimism and uncertainty orientation) and situational moderators (i.e., perceived ease and perceived control) were typically omitted in previous research. Although information avoidance and intentions to engage in preventative behaviors are conceptually distinct dependent variables, accounting for the limitations of research examining intentions to engage in preventative behavior will likely improve the study of information avoidance. The current investigation focused on the inclusion of situational moderators to improve the predictive ability of magnitude and likelihood. However, I addressed the aforementioned limitations in the design of the studies as well.

Overview and Hypotheses

I examined the effects of magnitude and likelihood on information avoidance in the context of screening for TAA deficiency (a fictitious medical condition). Participants learned about TAA deficiency and received the opportunity to receive diagnostic testing

for TAA deficiency. In both studies, I manipulated magnitude by describing TAA as either serious (causes discomfort and long-term health consequences) or not serious (little discomfort and no long-term consequences). Further, in both studies I manipulated likelihood. Based on a saliva test, the experimenter told participants that it is either unlikely that they are TAA deficient (approximately 5% likelihood) or likely (approximately 60% likelihood). I explored the ease of information attainment as a potential moderator in Study 1 and perceived control as a potential moderator in Study 2.

I hypothesized the following:

Hypothesis 1: I predicted that participants would display the most information avoidance (i.e., decline diagnostic testing for TAA deficiency) when magnitude was low, likelihood was low, and ease was low. Further, I predicted that participants would display the least information avoidance (i.e., greater seeking) when magnitude was low, likelihood was low, and ease was high. I considered avoidance scores in the remaining cells exploratory and expected them to fall between these two extreme values.

Hypothesis 2: I predicted that participants would display the most information avoidance when magnitude was high, likelihood was high, and control was low. Further, I predicted that participants would display the least information avoidance (i.e., greater seeking) when magnitude was high, likelihood was high, and control was high. I considered avoidance scores in the remaining cells exploratory and expected them to fall between these two extreme values.

CHAPTER 2
STUDY 1

Overview

Study 1 examined the effects of magnitude, likelihood, and ease on people's decision to avoid vs. seek information about whether they were TAA deficient. I predicted participants would be most likely to display information avoidance (i.e., decline TAA testing) when magnitude was low, likelihood was low, and ease was low. Conversely, I predicted that participants would be least likely to display information avoidance when magnitude was low, likelihood was low, and ease was high.

Method

Participants

Participants (97 women, 80 men) were undergraduate students recruited through the research pool managed by the psychology department. Participants were mostly freshman (freshman = 125, sophomores = 29, juniors = 15, seniors = 8) and Caucasian (Caucasian = 101, Hispanic = 28, African American = 25, Asian American = 14, and Other = 9). Prior to analysis, data from 11 participants were excluded because they did not find the study procedure believable. The number of excluded participants by condition is presented in Table 2-1.

Materials

Participants completed an informed consent form (see Appendix A) and demographic questionnaire (see Appendix B).

Uncertainty orientation

Uncertainty orientation refers to the extent to which people like to learn new things about themselves and their environment (Sorrentino & Short, 1986). People scoring high on the measure (i.e., uncertainty-oriented people) are information seekers. Uncertainty-oriented people seek information about themselves and their environment with the goal

of accuracy. People scoring low on the measure (i.e., certainty-oriented people) tend to avoid new information unless it confirms an already existing belief about themselves or their environment. Thus, certainty-oriented people are driven by the goal of consistency. The original measure of uncertainty orientation was projective, using a variation on the Thematic Apperception Test in which participants receive minimal initial information (e.g., "Two people are in a laboratory working on a piece of equipment") and then write a story (Brouwers & Sorrentino, 1993; Sorrentino & Short, 1986). Researchers then code the stories for the amount of uncertainty orientation. Because this type of projective measure is time consuming to administer and difficult to score reliably, I measured uncertainty orientation with a 7-item self-report measure (α = .76; Smith & Bristor, 1994) adapted from Sorrentino's (1968) uncertainty orientation self-report measure. Sample items include, "I believe it is important for me to challenge my beliefs", and "If I do not understand something I find out more about it." Participants responded to items on a scale from 1= *strongly disagree* to 7 = *strongly agree* (Appendix C).

Dispositional optimism

Dispositional optimism reflects a generalized tendency to have positive expectations about the future (Scheier & Carver, 1985). I measured dispositional optimism with the LOT-R (Scheier, Carver, & Bridges, 1994). The LOT-R consists of four filler items, three positively worded items, and three negatively worded items (Appendix D). The negatively worded items were reverse coded and added to the positively worded items to create a single index. Participants indicated their responses on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Research reveals that the scale is reliable (α = .82).

Procedure

The experimenter ran participants individually. On arrival to the study, the experimenter greeted participants and explained that they would complete a study examining perceptions of a TAA deficiency brochure that the Student Health Center was considering for adoption. Participants then completed the demographic questionnaire and measures of uncertainty orientation and dispositional optimism while the experimenter waited outside of the room. On completion of these questionnaires, participants retrieved the experimenter who then provided participants with information about TAA deficiency.

In the high magnitude condition, the experimenter explained that being TAA deficient leads to disturbances in digestion and insulin release that can be very severe and uncomfortable. Further, the experimenter told participants that being TAA deficient puts people at risk for severe pancreatic disorders in adult life. In the low magnitude condition, the experimenter explained that any disturbances in digestion and insulin release that may result from being TAA deficient would be mild, if detected. Further, being TAA deficient would not lead to any long-term negative consequences.

To bolster the cover story, the experimenter distributed the TAA brochure and participants evaluated it. I created two versions of the TAA brochure: one for participants in the high magnitude condition and one for participants in the low magnitude condition. The magnitude information presented in the brochures was consistent with the magnitude information the experimenter verbally reported. Thus, exposure to the magnitude manipulation occurred in both the verbal instructions and in the brochure.

Following the evaluation of the brochure, the experimenter reminded participants that they would have the opportunity to be tested for TAA deficiency. The experimenter explained that the only definitive test of TAA deficiency was a blood test (fingerprick).

However, because some participants are uncomfortable with blood tests, the experimenter explained that all participants would complete a saliva test prior to making the decision to undergo the blood test. The saliva test would give participants a rough indication of their risk or likelihood of being TAA deficient. Again, the experimenter emphasized that the only definitive TAA test was the blood test.

The experimenter began the saliva test procedure by asking participants to rinse their mouth out with mouthwash to ostensibly remove any food residual that may influence the saliva test. Next, the experimenter handed participants a pH strip and asked them to place it on their tongue until asked to remove it (5 seconds). Most pH strips turned a light green color. The experimenter then compared the pH strip to a Risk Assessment Chart. I created two Risk Assessment Charts so that light green color on the pH strip indicated approximately 5% risk in the low risk condition and approximately 60% in the high risk condition (see Appendices E and F).

The experimenter then informed participants that they had four options regarding testing for TAA deficiency: (1) get tested immediately, (2) sign up immediately for an appointment to be tested in the next week, (3) wait and take a contact number that they could call to set up an appointment at a later date, or (4) decline testing. In the high ease condition, the experimenter told participants that their supervisor, who was working next door, would come to the lab and perform the test immediately. In the low ease condition, the experimenter told participants that they must walk to Shands Hospital to take the TAA test. In all conditions, the experimenter assured participants that they would receive credit for completing the study regardless of testing decision.

The experimenter left the room while participants made their testing decision on a questionnaire. After making their testing decision, participants were debriefed.

Results

Manipulation Checks

The manipulations of the magnitude and likelihood variables were successful. Participants were significantly more likely in the high magnitude condition (*M* = 6.0, *SD* = 1.5) than in the low magnitude condition (*M* = 4.1, *SD* = 1.9) to believe that TAA deficiency is a serious medical condition, $F(1, 174) = 59.37$, $p < .001$, $\eta^2 = .25$. Similarly, participants were significantly more likely in the high likelihood condition (*M* = 5.9, *SD* = 1.6) than in the low likelihood condition (*M* = 1.7, *SD* = .8) to believe that they were at a high risk of being TAA deficient $F(1, 175) = 449.24$, $p < .001$, $\eta^2 = .72$.

The ease manipulation was not successful. Participants in the high ease condition (*M* = 7.3, *SD* = 1.4) and low ease condition (*M* = 6.9, *SD* = 1.8) reported equally high levels of agreement to the item, "Testing for TAA deficiency is easy", $F(1, 175) = 2.05$, $p = .15$, $\eta^2 = .01$. The failure of the ease manipulation check item to detect a difference in conditions is likely due to the item wording rather than due to a failure on the part of participants to detect the ease manipulation. I suspect that participants responded to the ease manipulation check question based on their evaluation of the finger prick information, which was the same in both the low and high ease conditions, rather than to whether they could be tested on the premises vs. at Shands Hospital.

Treating Information Avoidance Outcome as a Continuous Variable

The four decisions were analyzed on a continuum with lower scores indicating greater avoidance (see Figure 2-1 for frequencies). I examined normality and homogeneity of variance assumptions to determine whether analysis of variance (ANOVA) tests were appropriate. Results from the full factorial model indicated that the model residuals deviated from normality (see Figure 2-2) and that the homogeneity of variance assumption was violated, Levene's $F(7,166) = 11.35$, $p < .001$. To ensure

accuracy in the study results, I conducted comparable statistical tests that do not assume normality (i.e., Mann-Whitney test; Mann & Whitney, 1947) and homogeneity of variance (i.e., Welch test; Welch, 1947) as follow-up tests to all study results when information avoidance was the outcome. In each case, the conclusions regarding the rejection of the null hypothesis obtained from the alternative statistical tests and from the ANOVA tests were identical. For ease of presentation, results from the ANOVAs appear in the text. Results from the comparable statistic tests appear in Table 2-2.

Testing Covariates

Prior research suggests that two individual difference variables, uncertainty orientation and dispositional optimism, may predict decisions to seek or avoid information (Biesecker et al., 2000; Brouwers & Sorrentino, 1993). As such, I entered uncertainty orientation (α = .86, M = 36.8, SD = 6.0) and dispositional optimism (α = .83, M = 22.2, SD = 3.9), along with demographic variables (gender, class rank, and dichotomized ethnicity) in a regression model to predict information avoidance. None of these potential covariates predicted avoidance, ps ≥ .15.

Hypothesis Testing

The primary hypotheses of Study 1 were as follows: 1) I predicted that participants would be most likely to display information avoidance (i.e., decline TAA deficiency screening) when magnitude was low, likelihood was low, and ease was low; and 2) I predicted that participants would be least likely to display information avoidance when magnitude was low, likelihood was low, and ease was high. To test the first hypothesis I conducted a series of planned contrasts that compared participants in the low magnitude, low likelihood, and low ease condition with participants in all other conditions.

Inconsistent with predictions, the level of avoidance in the low magnitude, low likelihood, and low ease condition was not significantly greater than the level of

avoidance in all other conditions. As evident in Table 2-3, participants in the low magnitude, low likelihood, and low ease condition (M = 3.8, SD = .7) displayed significantly greater avoidance than did participants in all other conditions (p's ≤ .007), except one. The single exception was participants in the high magnitude, low likelihood, and low ease condition (M = 3.8, SD = .7), $t(39) = -.18$, *ns*. Otherwise, regardless of whether participants believed that TAA deficiency was or was not serious, participants displayed the greatest avoidance when they were unlikely to have the condition and the test was difficult to obtain.

To test hypothesis 2 I conducted a series of planned contrasts that compared participants in the low magnitude, low likelihood, and high ease condition with participants in all other conditions. Hypothesis 2 was not supported. I predicted that the least avoidance would be observed in the low magnitude, low likelihood, and high ease condition. However, as evident in Table 2-4, avoidance was significantly lower in the high magnitude, high likelihood, and high ease condition (M = 1.6, SD = 1.1) than in the low magnitude, low likelihood, and high ease condition (M = 2.5, SD = 1.5, $t(49) = -2.42$, $p < .05$. Participants were least likely to avoid the TAA test when they believed it was likely that they had a serious condition and it was easy to get the diagnostic test.

Omnibus ANOVA Test

I also tested the full factorial 2 (magnitude: low vs. high) x 2 (likelihood: low vs. high) x 2 (ease: low vs. high) ANOVA for exploratory purposes. All interactions and the main effect of magnitude were nonsignificant, ps > .07. Only the main effects of likelihood and ease were significant. Participants in the low likelihood condition (M = 3.2, SD = 1.3) were more likely than participants in the high likelihood condition (M = 2.5, SD = 1.3) to avoid TAA deficiency testing, $F(1,166) = 15.22$, $p < .001$, $\eta^2 = .08$. Similarly, participants in the low ease condition (M = 3.3, SD = 1.1) were more likely than

participants in the high ease condition (M = 2.4, SD = 1.4) to avoid TAA deficiency testing, $F(1,166) = 26.62$, $p < .001$, $\eta^2 = .14$.

Discussion

The Study 1 focal hypotheses were not supported. Participants did not display significantly more avoidance when TAA deficiency was not serious, not likely and testing to difficult to access. Further, participants did not display significantly more seeking when TAA deficiency was not serious, not likely, and testing was easy to access.

The pattern of means observed in Study 1 is perhaps best understood in terms of the significant main effects. Avoidance is greatest when 1) TAA risk is low than when it is high and 2) diagnostic testing is difficult to obtain than when it is easy to obtain. The study results reveal an interesting inconsistency in participants' behavior. On the one hand, participants acted as wise consumers of health information. High risk participants were more likely than low risk participants to agree to be tested. Both testing decisions are rather reasonable. On the other hand, participants perhaps did not act as wise health consumers in that they allowed a relatively minor variation in ease of test access influence their decision to undergo diagnostic testing.

Table 2-1. Number of Excluded Participants by Condition in Study 1

	Ease			
	Low Magnitude		High Magnitude	
Likelihood	Low	High	Low	High
Low	-	2	-	1
High	4	1	-	3

Note: All participants were excluded prior to data analysis.

Table 2-2. Follow-up Tests to Study Results for Study 1.

	F or *t* Statistic (Normality and Equal Variance Assumed)	Welch *F* or *t* Statistic (Equal Variance not Assumed)	Mann-Whitney-U *Z* Statistic (Normality not Assumed)
Hypothesis Tests (t's)			
Low MLE vs.			
High M and Low LE	-.18	-.18	-.39
Low ML and High E	3.46*	3.51*	-3.00*
Low ME and High L	-2.84*	-3.07*	-3.09*
High ML and Low E	-3.87**	-3.79*	-3.95*
High ME and Low L	-3.19*	-3.08*	-2.79*
Low M and High LE	-3.44*	-3.39*	-3.37*
High MLE	-7.65**	-8.39**	-5.25**
Low ML and High E vs.			
High M LE	-2.42*	-2.23*	-2.23*
Low MLE	3.46*	3.51*	-3.00*
High M and High LE	3.42*	3.42*	-2.84*
Low ME and High L	1.02	1.00	-.62
High ML and Low E	.34	.34	-.03
High ME and Low L	.18	.18	-.18
Low M and High LE	.24	.24	.00
Omnibus Tests (F's)			
Main Effect L	15.22**	15.80**	-4.40**
Main Effect E	26.62**	28.84**	-4.64**

*$p < .05$, ** $p < .001$
Notes: M = Magnitude, L = Likelihood, and E = Ease.

Table 2-3. Cell Mean Comparisons Between Low Magnitude, Likelihood, and Ease Condition with All Other Conditions.

		Ease			
		Low Magnitude		High Magnitude	
Likelihood		Low	High	Low	High
	Low	3.8 (.7)[a]	3.8 (.7)[a]	2.5 (1.5)[b]	2.6 (1.5)[b]
	High	2.9 (1.2)[b]	2.7 (1.1)[b]	2.6 (1.3)[b]	1.6 (1.1)[b]

Note: Significant means differences are denoted by differing superscripts. Higher numbers indicate greater avoidance.

Table 2-4. Cell Mean Comparisons Between the Low Magnitude, Low Likelihood, and High Ease Condition with All Other Conditions.

		Ease			
		Low Magnitude		High Magnitude	
Likelihood		Low	High	Low	High
	Low	3.8 (.7)[b]	3.8 (.7)[b]	2.5 (1.5)[a]	2.6 (1.5)[a]
	High	2.9 (1.2)[a]	2.7 (1.1)[a]	2.6 (1.3)[b]	1.6 (1.1)[b]

Note: Significant means differences are denoted by differing superscripts. Higher numbers indicate greater avoidance.

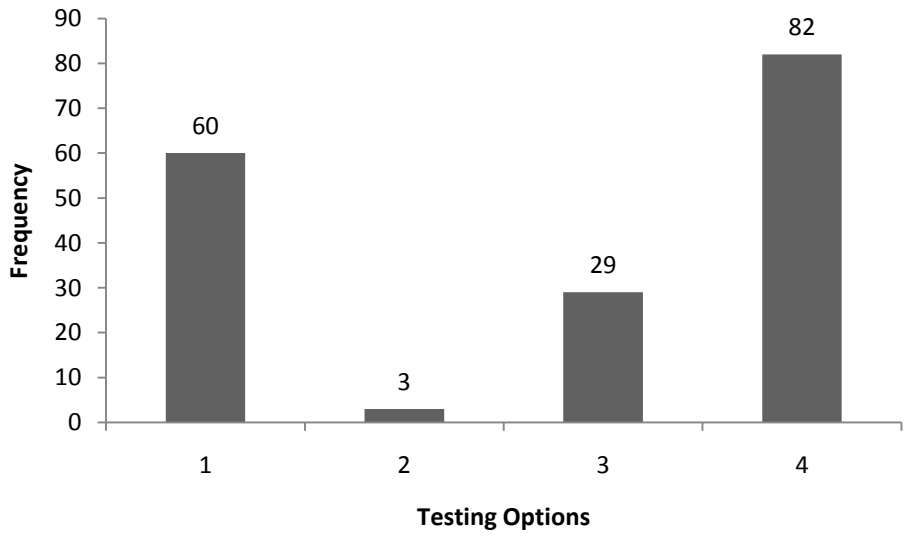


Figure 2-1. Frequency of TAA Deficiency Testing Options in Study 1 (Option 1 = Get tested; Option 2 = Make appointment to tested; Option 3 = Maybe make appointment at later date; and Option 4 = Decline testing).

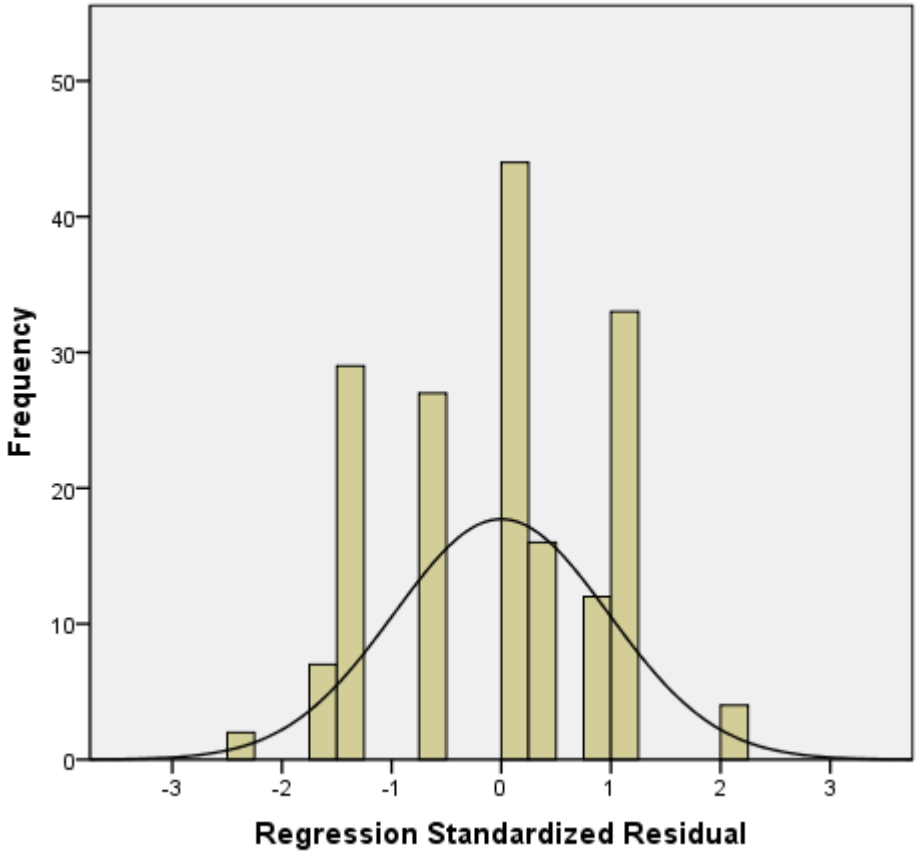


Figure 2-2. Distribution of Residuals for the Full Factorial Model (Study 1).

CHAPTER 3
STUDY 2

Overview

Study 2 examined the effects of magnitude, likelihood, and control on people's decision to avoid vs. seek information about whether they were TAA deficient. I predicted that the greatest levels of avoidance of TAA testing would occur when magnitude was high, likelihood was high, and control was low. Further, I predicted that the lowest levels of avoidance (i.e., greater seeking) would occur when magnitude was high, likelihood was high, and control was high.

Method

Participants and Materials

Participants (96 women and 83 men) were undergraduate students recruited through the research pool managed by the psychology department. As in Study 1, participants were mostly freshman (freshman = 93, sophomores = 47, juniors = 28, seniors = 10 and missing = 1) and Caucasian (Caucasian = 107, Hispanic = 22, African American = 24, Asian American = 13, and Other = 13). Prior to analysis, data from 19 participants were excluded because they did not find the study procedure believable. The number of excluded participants by conditions is presented in Table 3-1. Study materials were identical to the materials used in Study 1 with one exception. An additional questionnaire that measured other potential predictors of information avoidance was added to Study 2 for exploratory purposes (see Appendix G).

Procedure

Similar to Study 1, the experimenter explained to participants that they would complete a study examining perceptions of a TAA deficiency brochure that the Student Health Center was considering for adoption. After participants completed the initial questionnaires (i.e., demographics measure and individual difference measures), the

experimenter provided information about TAA deficiency. The information included the manipulation of magnitude (identical to the magnitude manipulation in Study 1) and a manipulation of control.

In the high control condition, the experimenter explained that people can influence the amount of TAA they have through changes in their daily health habits. Thus, participants have a great deal of control over the amount of TAA they possess. In the low control condition, the experimenter explained that changing health habits has little to no influence on TAA levels. Thus, participants have very little control over the amount of TAA they possess.

Again, participants evaluated a TAA brochure that contained general information about TAA and the magnitude manipulation. Participants also underwent the saliva test and likelihood manipulation. After delivering the likelihood manipulation, the experimenter offered participants an opportunity to be tested for TAA deficiency (ease was held constant at “high”). After making their choice, participants completed a final questionnaire (exploratory measure). Finally, all participants were debriefed and thanked for their participation.

Results

Manipulation Checks

Results indicated that the manipulations of all independent variables were successful. Participants were significantly more likely in the high magnitude condition ($M = 6.1$, $SD = 1.6$) than in the low magnitude condition ($M = 3.6$, $SD = 1.7$) to believe that TAA deficiency is a serious medical condition, $F(1, 177) = 94.18$, $p < .001$, $\eta 2 = .35$). Participants were significantly more likely in the high likelihood condition ($M = 6.1$, $SD = 1.7$) than in the low likelihood condition ($M = 1.7$, $SD = .9$) to believe that they were at a high risk of being TAA deficient, $F(1, 177) = 508.70$, $p < .001$, $\eta 2 = .74$. Finally,

participants were significantly more likely in the high control condition (M = 6.4, SD = 2.2) than in the low control condition (M = 4.2, SD = 2.1) to perceive that they had control over their TAA levels, F(1, 177) = 46.83, p < .001, η2 = .21).

Treating Information Avoidance Outcome as a Continuous Variable

The frequencies of the information avoidance response options are presented in Figure 3-1. Again I examined the normality and homogeneity of variance assumptions in the full factorial model to determine if ANOVA tests were appropriate. Results indicated that the model residuals slightly deviated from normality (see Figure 3-2) and the homogeneity of variance assumption was not met, Levene's $F(7,171) = 14.63$, $p < .001$. When available, I conducted comparable statistical tests that do not assume normality and homogeneity of variance as follow-up tests to all study results. In all cases, the conclusions reached from the comparable tests were identical to those reached with the typical ANOVA tests (see Table 3-2).

Testing Covariates

Consistent with Study 1, gender, class rank, ethnicity, uncertainty orientation (α = .83, M = 37.3, SD = 5.7), and dispositional optimism (α = .79, M = 22.2, SD = 3.8) were tested as potential predictors of information avoidance. Only one covariate, dichotomized ethnicity ("Caucasian" vs. "Other"), marginally predicted avoidance, $b = -.39$, $t(173) = -1.83$, $p = .07$. Non-Caucasian (i.e., "Other") participants were more likely than Caucasian participants avoid information. Because none of the covariates significantly predicted avoidance, none were entered as covariates in subsequent models.

Hypothesis Testing

The primary hypotheses of Study 2 were as follows: 1) I predicted that the greatest level of avoidance of TAA testing would occur when magnitude was high, likelihood was high, and control was low; and 2) I predicted that the lowest level of avoidance (i.e.,

greater seeking) would occur when magnitude was high, likelihood was high, and control was high. To test the first hypothesis I conducted a series of planned contrasts that compared participants in the high magnitude, high likelihood, and low control condition with participants in all other conditions.

Contrary to prediction, the highest level of avoidance was not found in the high magnitude, high likelihood, and low control condition. Significantly higher levels of avoidance were found in four other conditions (see Table 3-3). To test the second primary hypothesis, I compared participants in the high magnitude, high likelihood, and high control conditions to participants in all other conditions. Inconsistent with predictions, the lowest level of avoidance was not observed in the high magnitude, high likelihood, high control condition (see Table 3-4). Participants in the high magnitude, high likelihood, and high control condition (M = 1.5, SD = 1.0) did not significantly differ from participants in the high magnitude, high likelihood, and low control condition (M = 1.6, SD = 1.0; $t(44) = -.57$, *ns*). When participants consider whether to take a diagnostic test for a serious condition that they are likely to have, the extent to which participants perceive that they can control their TAA levels had no influence on their testing decision.

Omnibus ANOVA Test

I also tested the full factorial 2 (magnitude: low vs. high) x 2 (likelihood: low vs. high) x 2 (control: low vs. high) ANOVA for exploratory purposes. All interactions and the main effect of control were not significant, p's > .27. However, both the main effects of magnitude and likelihood were significant. Participants displayed greater avoidance in the low magnitude condition (M = 2.9, SD = 1.3) than in the high magnitude condition (M = 2.1, SD = 1.4), $F(1,171) = 18.95$, $p < .001$, $\eta^2 = .10$. Similarly, participants displayed greater avoidance in the low likelihood condition (M = 3.2, SD = 1.2) than in the high likelihood condition (M = 1.8, SD = 1.2), $F(1,171) = 63.81$, $p < .001$, $\eta^2 = .27$.

Exploring the Motivation for Information Avoidance and Seeking

Researchers believe people may choose to avoid information for three reasons: a) the information may produce an unpleasant emotional experience; b) the information may challenge a held cherished belief (e.g., that one is healthy); and c) learning the information may require a change in behavior (Sweeny, Melnyk, Malone & Shepperd, 2010). For example, participants may avoid learning whether they are TAA deficient because they think it will upset them, challenge their view as healthy young people, or compel them to change their health habits.

I included items assessing these three potential motivations in Study 2 for exploratory purposes. I tested the three motivations as potential mediators of the significant main effect relationships between magnitude and likelihood with information avoidance. I conducted a multiple mediation analysis (with a SPSS script developed by Preacher & Hayes, 2009) wherein I allowed all three motives to simultaneously mediate the main effect relationships. A multiple mediation analysis is preferable over separate mediation analyses because the indirect effects estimates produced by the program reflect the unique contributions of each mediator controlling for the other mediators.

A second advantage of using the multiple mediation script is that it employs a bootstrapping technique to test for mediation. Bootstrapping is a resampling method that entails taking many samples from the data set (e.g., 1000) with replacement, and calculating the desired parameter estimates in each of these samples. The bootstrapping program then calculates the mean values for the desired parameters over the many randomly selected samples. Thus, the bootstrap estimates of the indirect effect(s) are more reliable than are estimates obtained by the standard Sobel test.

I present the results from the multiple mediation analysis exploring the relationship between magnitude and information avoidance in Table 3-5. The only significant indirect

effect pertained to the motive to avoid a change in one's behavior. However, in the current study, the concern that one may have to change one's behavior appears to motivate seeking rather than avoidance. As evident in the Figure 3-3, participants in the high magnitude condition, compared to participants in the low magnitude condition, indicated that the possibility that they would have to change their behavior as a result of their TAA test results was a greater influence on their testing decision, $b = 1.11$, $t(177) = 2.99$, $p < .01$. Further, the influence of the possible behavior change was associated with greater information seeking, $b = -.26$, $t(177) = 5.14$, $p < .001$. Thus, just as participants may avoid information to avoid an unwanted behavior change, it is also possible, as in the current study, that participants may seek information because they want to make a behavior change if they perceive the change as needed. Because the direct effect of magnitude on information avoidance was significant with the mediators in the model, $b = -.55$, $t(177) = -2.92$, $p < .01$, the behavior change motive was a partial mediator.

The pattern of results in the multiple mediation analyses examining the relationship between likelihood and information avoidance (see Table 3-6) was identical to the pattern in the magnitude multiple mediation. Again, only the motive involving a change in behavior was a significant mediator. Further, the influence of having to change one's behavior on the testing decision was greater among participants in the high likelihood condition than in the low likelihood condition, $b = 1.71$, $t(177) = 4.76$, $p < .001$, and corresponded to greater seeking behavior, $b = -.23$, $t(177) = -4.79$, $p < .001$ (see Figure 3-4). Finally, the behavior change motive partially mediated the relationship between likelihood and information avoidance, $b = -1.13$, $t(177) = -6.20$, $p < .001$.

Exploring Treatability and Magnitude as Predictors of Information Avoidance

There are multiple ways to operationalize control. In the current study, I examined control over developing a medical condition. Previous researchers have examined

control over the management of the condition (i.e., treatability). Dawson, Savitsky & Dunning (2006) examined the effects of treatability and seriousness of a medical condition on willingness to undergo diagnostic testing. Results indicated that participants were most likely to avoid diagnostic testing when they perceived that the condition was severe and untreatable.

In an attempt to replicate this prior study, treatability was measured in the current study and allowed to interact with magnitude (see Figure 3-5). Although the treatability by magnitude interaction was not significant, $b = .15$, $t(175) = 1.52$, $p = .13$, the simple effect tests revealed that treatability was unrelated to avoidance when magnitude was high ($b = .04$, $t(176) = -.49$, *ns*) and marginally related to avoidance when magnitude was low ($b = -.11$, $t(176) = -1.80$, $p = .07$). In short, the treatability by magnitude interaction effect pattern found in prior research was not replicated in the current study. In prior research, the greatest level of avoidance occurred when severity was high and treatability was low, whereas the greatest level of avoidance in the current study occurred when both severity and treatability were low.

Discussion

The Study 2 focal hypotheses were not supported. Participants did not display significantly more avoidance when TAA deficiency was serious, likely and uncontrollable. Further, participants did not display significantly more seeking when TAA deficiency was serious, likely, and controllable.

As was true in Study 1, the study results are perhaps best explained by the significant main effects. Participants avoided diagnostic testing for TAA deficiency when the experimenter explained that TAA deficiency was not serious and that participants were unlikely to experience the condition. Thus, participants that were the least likely to need diagnostic testing were also the participants least likely to seek diagnostic testing.

Further, exploratory analyses revealed that participants' concern that a positive TAA deficiency test may require a change in their health behavior partially explained how perceptions of likely and magnitude influence testing decisions.

Table 3-1. Number of Excluded Participants by Condition in Study 2.

		Control			
		Low Magnitude		High Magnitude	
Likelihood		Low	High	Low	High
	Low	2	-	1	3
	High	2	2	5	4

Note: All participants were excluded prior to data analysis.

Table 3-2. Follow-up Tests to Study Results for Study 2.

	F or *t* Statistic (Normality and Equal Variance Assumed)	Welch *F* or *t* Statistic (Equal Variance not Assumed)	Mann-Whitney-U *Z* Statistic (Normality not Assumed)
Hypothesis Tests (t's)			
High ML and Low C vs.			
Low MLC	8.57**	8.64**	-5.38**
High M and Low LC	2.59*	2.59*	-2.23*
Low MC and High L	1.91	1.88	-1.65
Low ML and High C	7.70**	7.75**	-5.03**
High MC and Low L	3.53*	3.45*	-3.01*
Low M and High LC	.79	.77	-.49
High MLC	-.57	-.57	-.94
High MLC vs.			
Low M LC	9.14**	9.06**	-5.41**
High M and Low LC	2.96*	3.01*	-2.75*
Low MC and High L	2.32*	2.32*	-2.27*
High ML and Low C	-.57	-.57	-.94
Low ML and High C	8.25**	8.19**	-5.06**
High MC and Low L	3.89**	3.86**	-3.38*
Low M and High LC	1.25	1.24	-1.24
Omnibus Tests (F's)			
Main Effect M	18.95**	16.15**	-3.74**
Main Effect L	63.81**	58.78**	-6.66**

*$p < .05$, ** $p < .001$
Notes: M = Magnitude, L = Likelihood, and C = Control.

Table 3-3. Cell Mean Comparisons Between the High Magnitude, High Likelihood, and Low Control Condition with All Other Conditions.

		Control			
		Low Magnitude		High Magnitude	
Likelihood		Low	High	Low	High
	Low	3.8 (.7)[b]	2.6 (1.5)[b]	3.6 (.7)[b]	2.9 (1.4)[b]
	High	2.3 (1.4)[a]	1.6 (1.0)[a]	1.9 (1.3)[a]	1.5 (1.0)[a]

Note: Significant means differences are denoted by differing superscripts. Higher numbers indicate greater avoidance.

Table 3-4. Cell Mean Comparisons Between the High Magnitude, High Likelihood, and High Control Condition with All Other Conditions.

		Control			
		Low Magnitude		High Magnitude	
Likelihood		Low	High	Low	High
	Low	3.8 (.7)[b]	2.6 (1.5)[b]	3.6 (.7)[b]	2.9 (1.4)[b]
	High	2.3 (1.4)[b]	1.6 (1.0)[a]	1.9 (1.3)[a]	1.5 (1.0)[a]

Note: Significant means differences are denoted by differing superscripts. Higher numbers indicate greater avoidance.

Table 3-5. Multiple Mediation Examining Relationship Between Magnitude and Information Avoidance.

	Normal Theory			Bootstrap (J = 1000) Bias Corrected and Accelerated			
						95% CI	
Indirect Effects	*b*	*SE*	*p*	*M*	*SD*	Lower	Upper
Negative Emotions	.03	.03	*ns*	.03	.04	-.03	.15
Cherished Beliefs	.01	.04	*ns*	.01	.04	-.06	.16
Change Behavior	-.29	.11	< .05	-.29	.11	-.54	-.09

Table 3-6. Multiple Mediation Examining Relationship Between Likelihood and Information Avoidance.

	Normal Theory			Bootstrap (J = 1000) Bias Corrected and Accelerated			
						95% CI	
Indirect Effects	*b*	*SE*	*p*	*M*	*SD*	Lower	Upper
Negative Emotions	.07	.05	*ns*	.08	.06	-.00	.24
Cherished Beliefs	.04	.07	*ns*	.04	.09	-.09	.27
Change Behavior	-.39	.12	< .05	-.39	.10	-.62	-.20

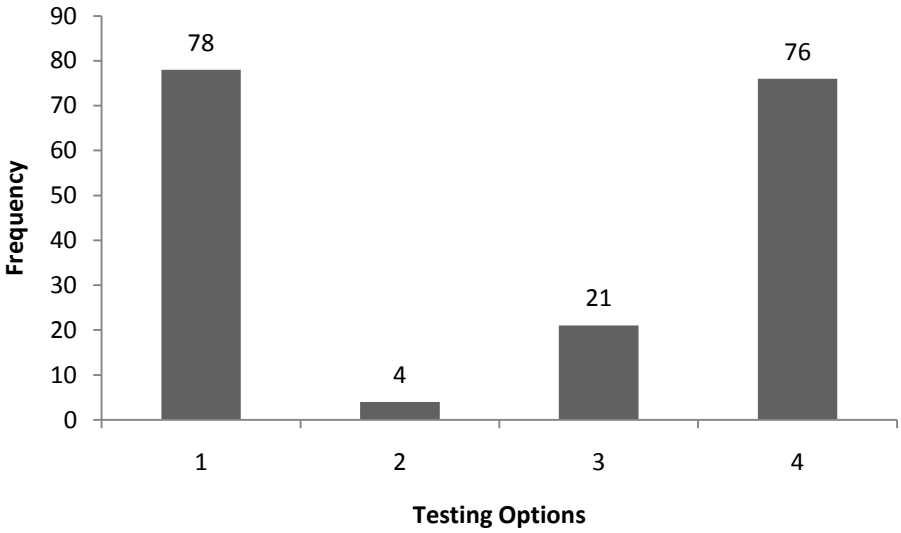


Figure 3-1. Frequency of TAA Deficiency Testing Options in Study 2 (Option 1 = Get tested; Option 2 = Make appointment to tested; Option 3 = Maybe make appointment at later date; and Option 4 = Decline testing).

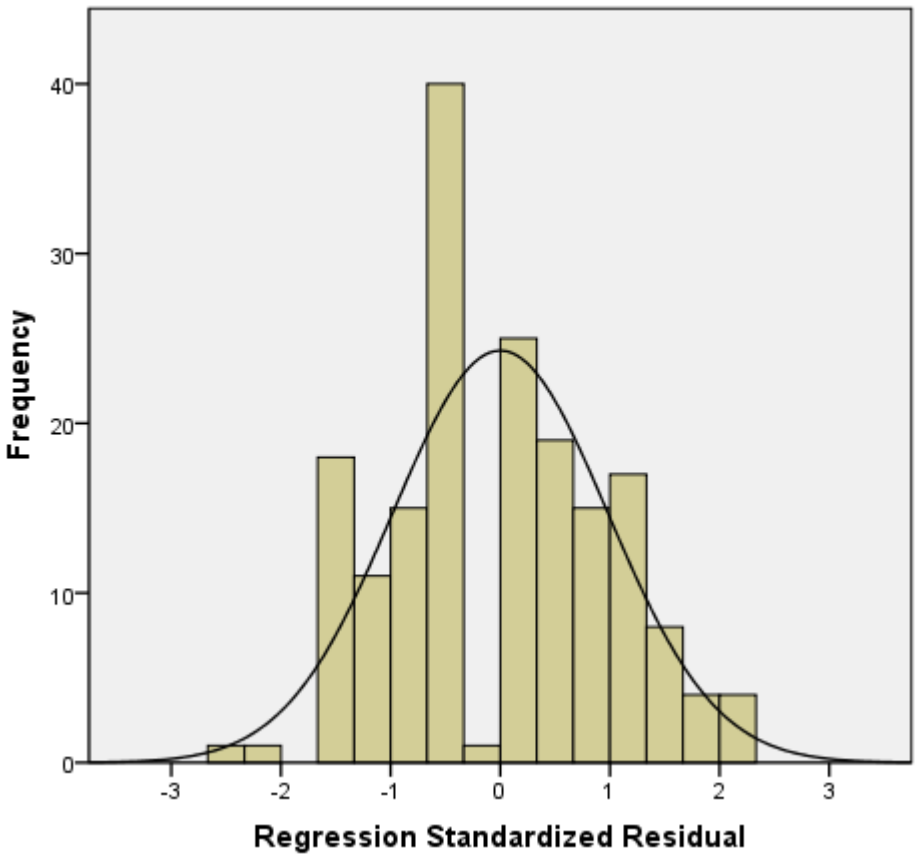


Figure 3-2. Distribution of Residuals for the Full Factorial Model (Study 2).

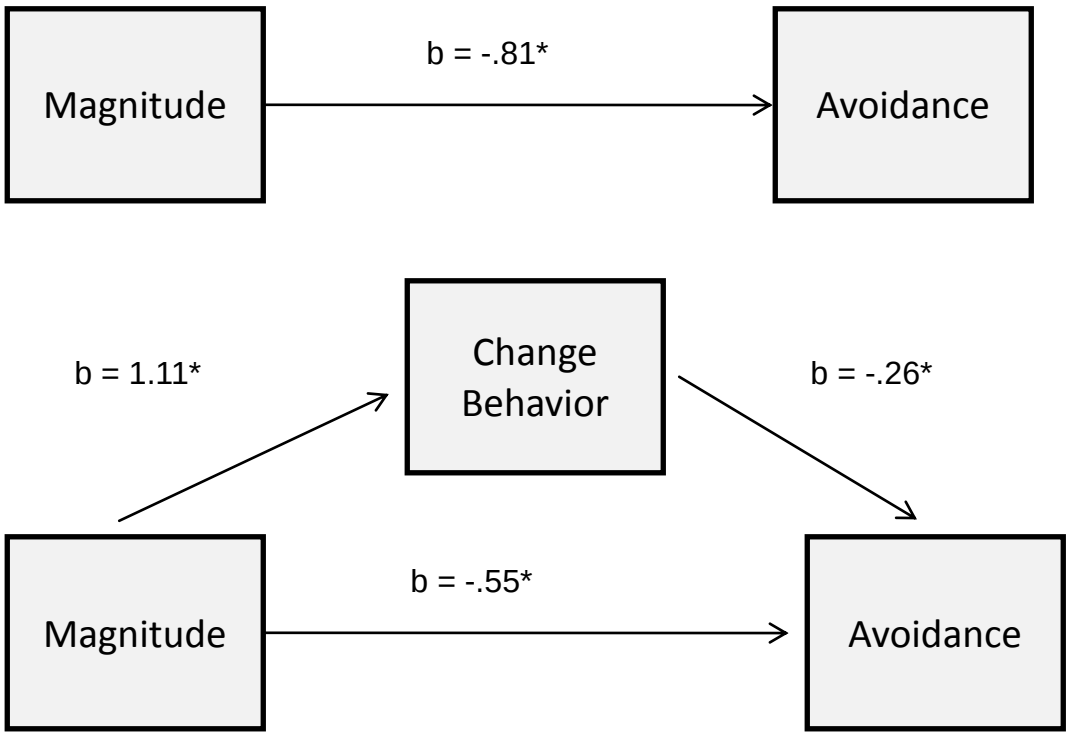


Figure 3-3. Behavior Change as a Partial Mediator of the Relationship between Magnitude and Information Avoidance. *$p < .05$.

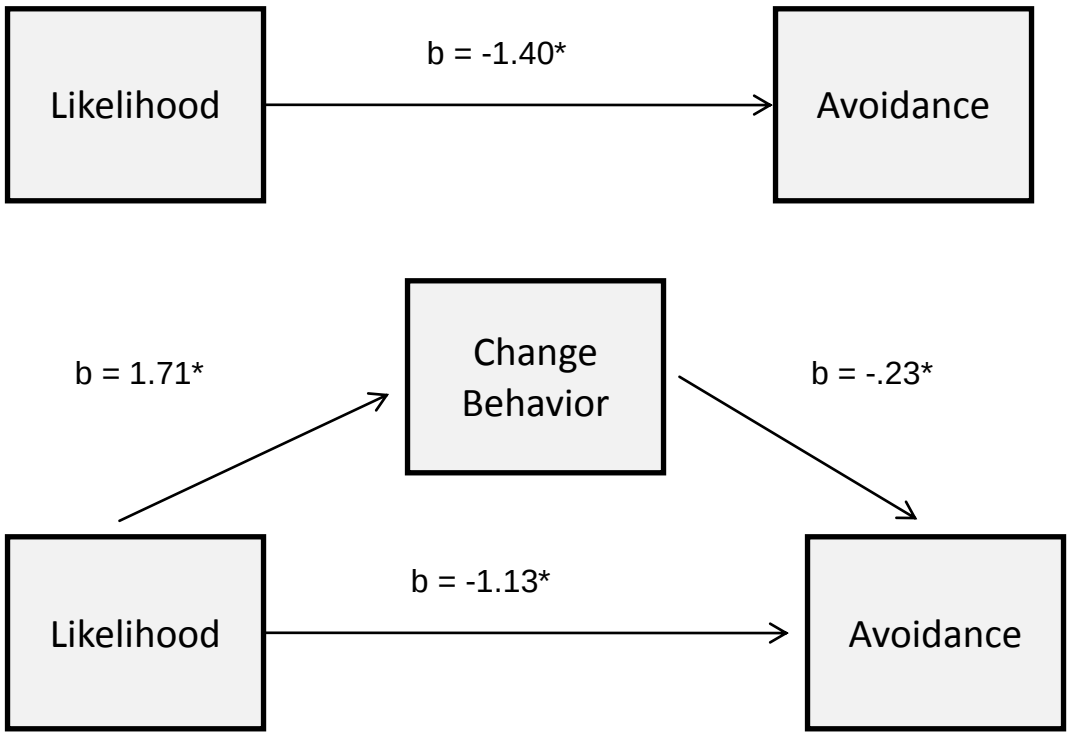


Figure 3-4. Behavior Change as a Partial Mediator of the Relationship between Likelihood and Information Avoidance. *$p < .05$.

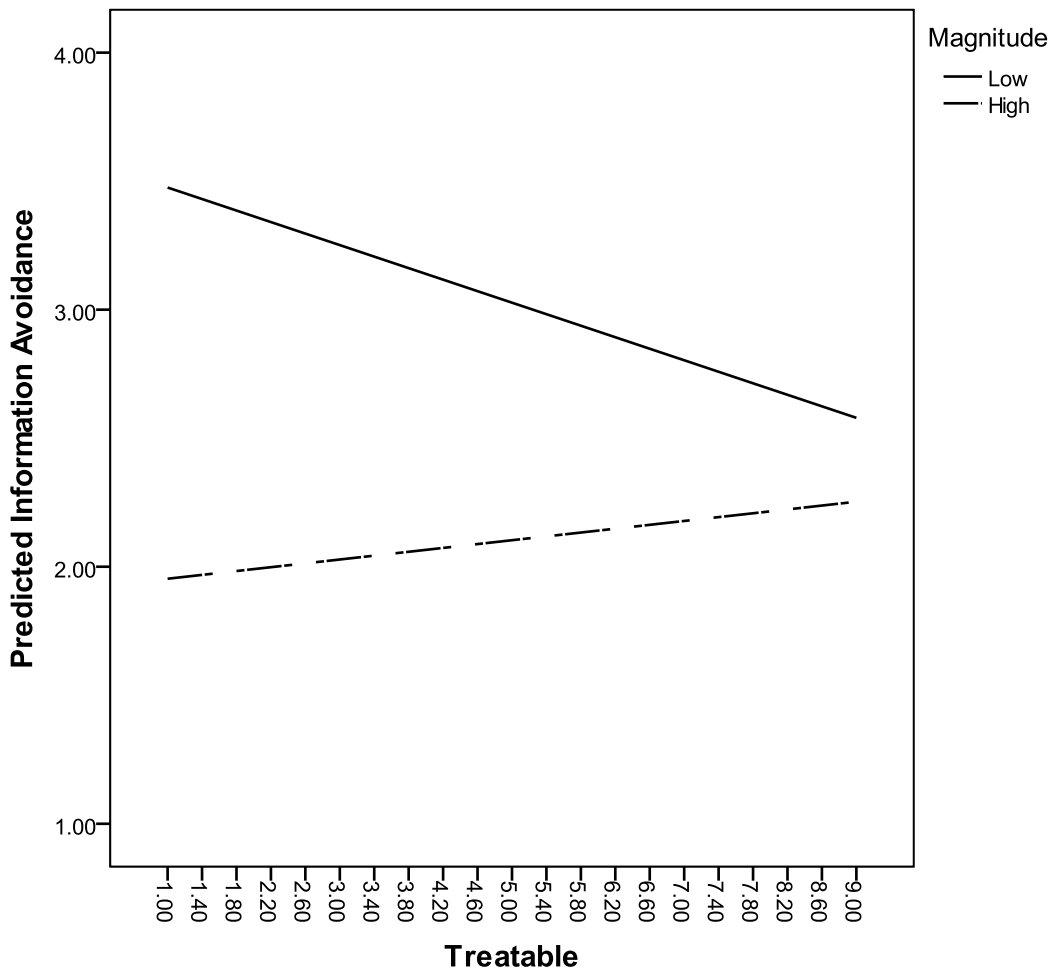


Figure 3-5. Treatability and Magnitude as Predictors of Information Avoidance.

CHAPTER 4
GENERAL DISCUSSION

Overview

The goal this dissertation was to explore how perceptions of the magnitude of a medical condition and the likelihood of having that condition influence decisions to seek or avoid diagnostic testing. I hypothesized that the inclusion of two additional variables, ease of test access (Study 1) and control over developing the condition (Study 2), were necessary to fully understand the relationships between magnitude, likelihood, and information avoidance. My hypotheses were not supported. I summarized results relating to each of the independent variables below.

Ease

Ease of information attainment refers to the ease with which one can acquire diagnostic testing. In Study 1, I examined the roles of ease, magnitude, and likelihood in predicting information avoidance. I proposed that the inclusion of ease was necessary to understand how magnitude and likelihood relate to information avoidance when both magnitude and likelihood are low.

The Study 1 results did not support my hypotheses. Although avoidance was high in the low magnitude, low likelihood, and low ease condition, as expected, it was equally high in the high magnitude, low likelihood, and low ease condition. When both likelihood and ease were low, level of magnitude did not influence decisions to avoid diagnostic testing. Also contrary to predictions, the least amount of avoidance occurred in the high magnitude, high likelihood, and high ease condition, rather than in the low magnitude, low likelihood, and high ease condition. Even though participants in the high magnitude, high likelihood, and high ease condition are likely to hear bad news, they are

significantly more likely to seek testing than are participants in the low magnitude, low likelihood, and high ease condition who are likely to receive good news if they undergo testing.

Additional analyses revealed a significant main effect of ease on information avoidance. Participants were more likely to undergo testing when testing was easy versus when it was difficult. Consistent with previous results, the effect of ease on health behavior outcomes was stronger than the other variables considered (see Milne et al., 2000). Although ease of attainment is perhaps less psychologically interesting than other variables of interest (e.g., likelihood), researchers should take the effects of ease in to account when trying to understand or explain health behavior. The results of Study 1, along with previous investigations, suggest that people consider the ease of test access when deciding to undergo diagnostic testing, regardless of the severity of the disease or their likelihood of having the disease.

Control

I defined control as the extent to which participant's behavior determined whether they were TAA deficient (akin to "response efficacy"). In Study 2, I examined the effects of control, magnitude, and likelihood on information avoidance. I believed that the inclusion of control was necessary to understand how magnitude and likelihood related to information avoidance when both magnitude and likelihood were high.

Again, my hypotheses were not supported. The observed pattern of means suggest that control did not influence participant decisions. Participants in the high magnitude, high likelihood, and high control condition did not differ from participants in the high magnitude, high likelihood, and low control condition in their TAA deficiency testing decision. Further, the main effect of control was not significant.

Why did control fail to influence testing decisions? Recall that control in Study 2 was defined as the extent to which participants could control the development of TAA deficiency through their health behaviors. By the time participants arrived at the study and learned about TAA deficiency, the window of time in which they could potentially control their health behavior to minimize their TAA deficiency risk had already passed. There was little participants could do to change their outcome between learning about TAA deficiency and making their testing decisions. Thus, this operation of control (i.e., control over development of the condition) was perhaps a poor way to define control when the outcome measure was testing decision.

In prior investigations of decisions to engage in diagnostic testing, researchers operationalized control as the extent to which a medical condition was treatable. Researchers found that participants were more likely to seek testing when they believed a medical condition was severe and treatable, but more likely to avoid testing when they believed the condition was severe and untreatable (Dawson et al., 2006). Thus, treatability may be a better operation of control when testing decision is the outcome of interest.

For exploratory purposes, I attempted to replicate the treatability by magnitude interaction found in previous research (i.e., Dawson et al., 2006). However, the results were inconsistent with past research. In Study 2, I found that treatability was unrelated to avoidance when magnitude was high and marginally related to avoidance when magnitude was low. Avoidance was greatest when both treatability and magnitude were low.

The inconsistency between my research and the prior research may do due to methodological differences. For example, treatability was measured in Study 2 yet manipulated in the prior research. Regardless, researchers should continue to evaluate role of treatability in testing decisions in future research.

In addition, researchers should not ignore the potential role of control, as defined as control over developing the condition, in information avoidance. Modifications to the study paradigm may allow researchers to explore this link. For example, instead of using testing decision as the outcome, researchers could use risk for developing the condition as the outcome. Researchers that want to study testing decisions as the outcome could consider increasing the time delay between the delivery of the control manipulation and the measurement of the testing decision. An increased time delay between the manipulation and the outcome measurement should increase the likelihood that control will predict the outcome.

Magnitude

Magnitude (i.e., the severity of TAA deficiency) was not a consistent significant predictor of information avoidance in my studies. Magnitude did not significantly predict testing decisions in Study1 but did significantly predict testing decisions in Study 2. Participants were more likely to avoid testing in the low magnitude condition than in the high magnitude condition. Although the magnitude main effect in Study 1 did not reach conventional levels of significance, the direction of the means was consistent with the direction observed in Study 2. In both studies lower levels of magnitude corresponded with greater avoidance.

It is unclear why magnitude significantly predicted information avoidance in Study 2 but not in Study 1? The manipulation of magnitude in both studies was identical.

Thus, the difference in study results is not due to changes in the manipulation of magnitude. However, several other explanations seem possible. First, the likelihood manipulation may have affected perceptions of magnitude. Past researchers have noted that magnitude and likelihood can become confounded in the minds of participants. Specially, participants have difficulty imagining that a disease can be both severe and common (see Jemmott, Ditto, & Croyle, 1986). Thus, perceptions of severity among participants in the high magnitude may differ depending on which likelihood condition they were assigned. Although this explanation seems plausible, additional analyses do not support it. Specifically, if the likelihood manipulation affected perceptions of magnitude, then participants in the high and low likelihood conditions would differ in their responses to the magnitude manipulation check item. However, likelihood did not influence perceptions of the severity of TAA deficiency in either Study 1, $F(1, 174) = .01$, *ns*, or Study 2, $F(1, 177) = .02$, *ns*. Thus, the inconsistent effect of magnitude across studies was not due to a confound between likelihood and magnitude one of the studies.

Second, perhaps the manipulation of magnitude was not strong enough to produce consistent effects. In the low magnitude condition, the experimenter explained that any discomfort from TAA deficiency was mild and that there were no long-term negative consequences. In the high magnitude condition, the experimenter explained that TAA deficiency leads to disturbances in digestion that can be severe and long-term (i.e., disturbances throughout adulthood). In both studies, participants in the high magnitude condition rated TAA deficiency as a significantly more serious condition than did participants in the low magnitude condition. However, in both studies, mean scores

on the magnitude manipulation check item (a 9-point scale) hovered just below the middle of the scale in the low magnitude group (Study 1: *M* = 4.1, Study 2: *M* = 3.6) and just above in the high magnitude group (Study 1: *M* = 6.0, Study 2: *M* = 6.1). Thus, a stronger manipulation that portrayed TAA deficiency as even less serious in the low magnitude condition and even more serious in the high magnitude condition may produce consistent effects of magnitude.

Finally, it is possible that the choice of magnitude operation, rather than the manipulation strength, is responsible for the inconsistent magnitude effects. Researchers have argued that inconsistencies in the effects of magnitude in prior investigations were due to the use of less effective operations of severity (Milne, et al., 2000). In the current studies, magnitude varied in terms of the severity of symptoms (low vs. high) and the duration of the symptoms (brief vs. long-term). Other potential operations of severity include variations in the onset of the disease (near vs. distant), the speed of onset (gradual vs. sudden), and the visibility of symptoms (low vs. high; see Smith-Klohn & Rogers, 1991). Future researchers may want to consider alternative operations of the magnitude variable.

Likelihood

Likelihood consistently predicted information avoidance in both studies. Avoidance was greater in the low likelihood condition than in the high likelihood condition. The few prior studies that have examined the effects of likelihood on information avoidance also found that lower perceptions of likelihood corresponded with greater information avoidance (e.g., Babul et al., 1993, Lerman et al.,1996). Thus, a consistent link between low risk and avoidance is beginning to emerge in the information avoidance literature.

Individual Difference Measures

I examined two potential individual difference predictors of information avoidance: dispositional optimism and uncertainty orientation. Neither significantly predicted information avoidance. It is unclear why dispositional optimism failed to predict avoidance. In prior research, greater optimism corresponded with greater avoidance (Biesecker et al., 2000). However, researchers (i.e., Biesecker et al., 2000) listed a Cronbach's alpha of .38 for dispositional optimism (measured by the Lot-R) in their sample. Such a low alpha makes it difficult to draw conclusions regarding relationships between optimism and any other variables. Thus, it is difficult to determine why I found no relationship between optimism (with an adequate alpha) and avoidance in the current studies.

It is perhaps not surprising that uncertainty orientation failed to predict information avoidance. In prior research, uncertainty orientation was used as a moderator rather than a standalone covariate. Researchers found that uncertainty orientation interacted with threat (a variable that combined both magnitude and likelihood) and diagnosticity (the extent to which a test was diagnostic) to predict testing decisions (Brouwers & Sorrentino, 1993). I attempted to replicate this finding in the current studies by testing the interaction between magnitude, likelihood, and uncertainty orientation. (Because the test for TAA deficiency was described to participants as diagnostic, I assumed that diagnosticity was held constant at high in the current studies.) In both studies, the interaction was not significant, p's > .20. Additional research is needed to understand the circumstances in which uncertainty orientation predicts avoidance.

Undoubtedly, individual differences in information avoidance exist. No doubt, some people are more likely than are others to avoid information regardless of the domain

(e.g., health, relationships). My collaborators and I are currently working to develop an informational avoidance scale that attempts to measure individual differences in the tendency to avoid potentially unwanted information. Our hope is that the scale will capture variation due to general tendencies to seek or avoid information, thus allowing for a clearer examination of the effects of situational variables (e.g., ease and control) on avoidance.

Revisiting the Information Avoidance Construct

Information avoidance is defined as “any behavior designed to prevent or delay the acquisition of available but potentially unwanted knowledge” (Sweeny, Melnyk, Malone, & Shepperd, 2008). In my studies, information avoidance was operationalized as participants’ decision to seek or avoid diagnostic testing for TAA deficiency. Regardless of the reason for making the testing decision, higher scores on the outcome measure were considered indicative of greater avoidance.

An important next step in studying information avoidance is moving toward an understanding of why people avoid information. In the current studies, participants avoided diagnostic testing when it was more difficult to attain, they were at low risk for the condition, and the condition was considered not very severe (Study 2 but not Study 1). Why did participants avoid in these circumstances? It seems likely that participants felt that the costs of undergoing a diagnostic test (e.g., extra time and potential slight pain) outweighed the benefits of knowing whether they were TAA deficient given their circumstances. Consistent with this reasoning, in prior research finds that participants consider the costs and benefits of avoiding vs. not avoiding information when deciding whether to seek or avoid information (Sweeny & Malone, 2010).

Although a cost/benefit analysis framework is useful in understanding information avoidance, it is also very broad. My collaborators and I have proposed three specific reasons why people avoid information: a) the information may produce an unpleasant emotional experience; b) the information may challenge a held cherished belief (e.g., that one is healthy); and c) learning the information may require a change in behavior (Sweeny et al., 2010).

For exploratory purposes, I tested whether these three motivations mediated the links between magnitude and likelihood with testing decisions in Study 2. Only the motive involving a change in behavior was a significant partial mediator. However, concern that one may have to change one's behavior appeared to motivate seeking behavior rather than avoidance. Participants opted to learn if they were TAA deficient so that they could implement behavior changes. Thus, it is possible that concern over changing one's behavior influences both decisions to seek and decisions to avoid information.

Implications

Research exploring predictors of information avoidance has implications for everyday health decision making. People may sometimes avoid health information that would greatly benefit them. By understanding the factors that predict avoidance, researchers and health practitioners can design more effective programs and health campaigns that increase participation of those in need of services. Because magnitude did not consistently predict avoidance, I only present implications regarding ease and likelihood.

Ease was the strongest predictor of avoidance in Study 1. Researchers and health practitioners should consider increasing the ease with which people can obtain health

information and services if they wish to increase rates of service use. Ease can be increased in numerous ways. For example, researchers found that gay and bisexual men were more willing to undergo screening for anal cancer when it was free than when it was $150 (Reed et al., 2010). In addition, past research suggests that patients are more likely to undergo a mammogram when appointments are available on the same day as the primary care visit in which the doctor recommends a mammogram than when participants must make an appointment for a later date (Dolan et al., 1999). However, other operations of ease may be less effective. Past research indicates that the effects of transportation incentives on willingness to attend follow-up visits after an abnormal pap smear were mixed (Yabroff, Kerner, & Mandelblatt 2000). Thus, additional research is needed to determine the conditions in which various operations of ease are most effective.

Results from both Studies 1 and 2 suggest that people consider their risk when deciding to seek vs. avoid health information. Low risk corresponded with greater avoidance. The link between low risk and avoidance is not problematic for people who are legitimately at low risk for a given condition. Problems occur when people are at high risk for a condition but they perceive that they are at low risk. Thus, interventions should seek to increase perceptions of risk among those in the high risk population. Further, designers of interventions may want to consider providing physical evidence of risk to participants. In the current studies, participants saw physical evidence of their risk when they viewed their pH strip relative to the risk assessment chart. People may find physical evidence of their risk more persuasive than simply being told that they are at risk.

Summary

People frequently face potentially unwanted information (e.g., the balance on their credit card, their current weight, whether they have high blood pressure). The goal of this dissertation was to explore how four factors, magnitude, likelihood, ease and control, influence information avoidance decisions. Clear relationships between both likelihood and ease with avoidance emerged, such that low likelihood and low ease both corresponded with greater avoidance. However, the relationship between magnitude and avoidance was inconsistent and control was unrelated to avoidance. Future research is needed to understand if, and under what circumstances, magnitude and control might influence information avoidance.

APPENDIX A
CONSENT FORM

I will evaluate a brochure and answer several questionnaires in this study. These questionnaires will ask about my feelings towards different behaviors. I will receive 2 experimental credits for completing the questionnaires today.

Time Required: 1 hour

Risks and Benefits: I will benefit by learning about research. There are no risks.

Compensation: I will receive 2 credits for participation.

Confidentiality: My responses will be confidential to the extent provided by the law. I will be assigned a code number, and my responses will be stored in a computer according to the code number and not by my name. As such, my name will not be associated with my responses and will not be used in any report. Moreover, all data will be analyzed by group averages and not by individual responses.

Voluntary Participation & Right to Withdraw: I understand that my participation in this study is voluntary. There is no penalty for not participating. I have the right to withdraw from the study at any time without consequence.

Whom to Contact if You have Questions about the Study:

James A. Shepperd, Faculty Advisor, Dept. of Psychology, University of Florida, 392-0601 x 248.
Wendi Malone, Principal Investigator, Dept. of Psychology, University of Florida, 392-0601 x 261.

Whom to Contact about Your Rights as a Research Participant in the Study:

UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph. 392-0433.

By signing below I acknowledge that I have read the above information and agree to participate in this study.

_____ _____

Signature of Research Participant Date

APPENDIX B
DEMOGRAPHIC QUESTIONNAIRE

Please answer the following demographic questions.

1. Sex: _____Female _____Male

2. Ethnicity:
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Native Hawaiian or Other Pacific Islander
    e. Hispanic
    f. White, non-Hispanic
    g. Other:_____ (please specify)

3. Class rank:
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Grad Student
    f. Other:_____ (please specify)

APPENDIX C
UNCERTAINTY ORIENTATION

Please read and indicate the extent to which you agree with the following items:

1. I believe it is important for me to challenge my beliefs.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

2. If I do not understand something I find out about it.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

3. I like to experiment with new ideas, even if they turn out later to be a total waste of time.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

4. I enjoy spending time discovering new things.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

5. I like to find out why things happen.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

6. I often put myself in situations in which I could learn something new.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

7. I enjoy thinking about ideas that challenge my views of the world.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

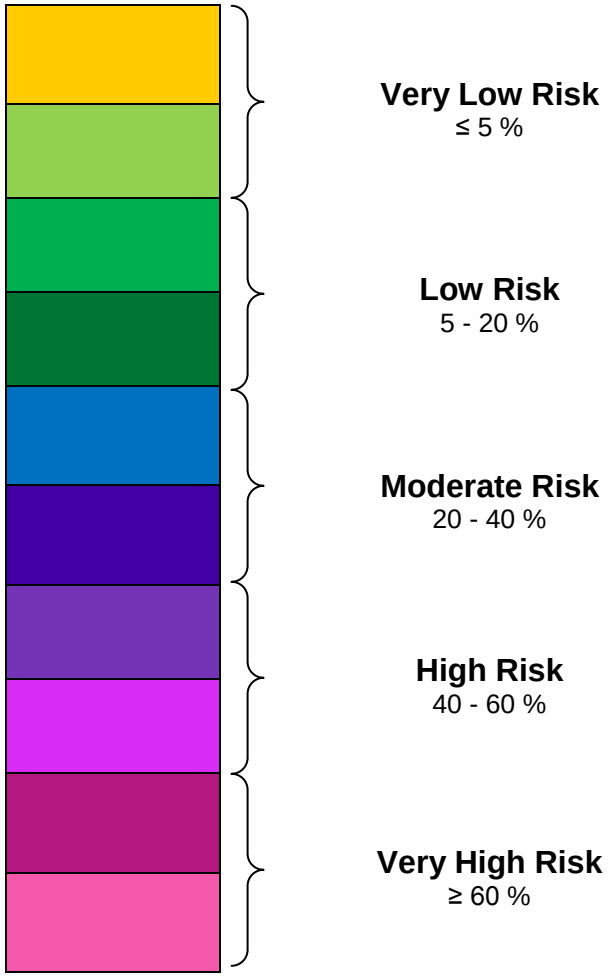
APPENDIX D
DISPOSITIONAL OPTIMISM

Please respond to each item by writing the number that best describes your feelings, using the following scale:

1	2	3	4	5
Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree

_____ 1. In uncertain times, I usually expect the best.
_____ 2. If something can go wrong for me, it will.
_____ 3. I'm always optimistic about my future.
_____ 4. It's easy for me to relax.
_____ 5. I enjoy my friends a lot.
_____ 6. It's important for me to keep busy.
_____ 7. I hardly ever expect things to go my way
_____ 8. I don't get upset too easily.
_____ 9. I rarely count on good things to happen to me.
_____ 10. Overall, I expect more good things to happen to me than bad.

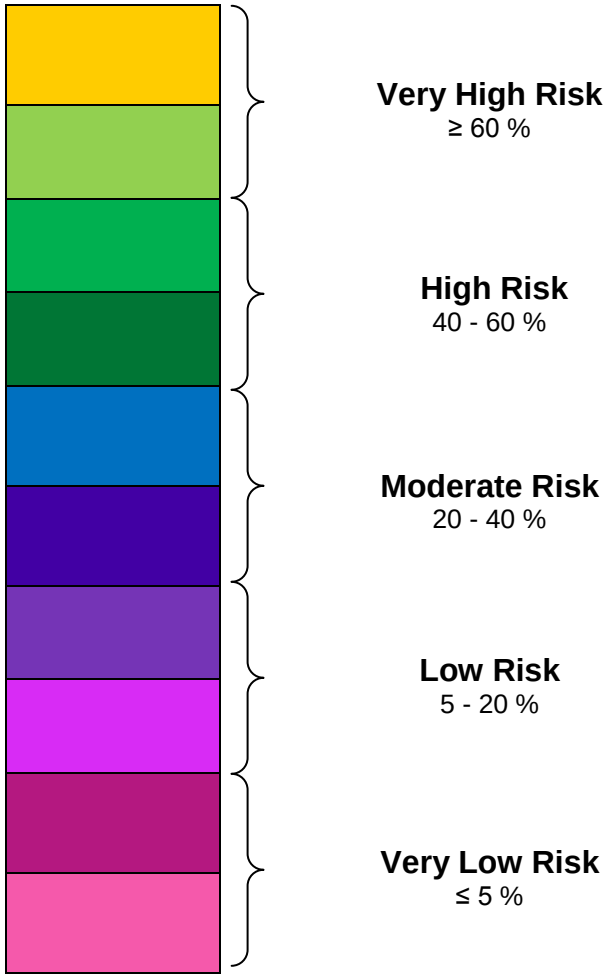
APPENDIX E
LOW LIKELIHOOD CONDITION



Risk Assessment Chart:

Thioamine Acetylase (TAA)

APPENDIX F
HIGH LIKELIHOOD CONDITION



Risk Assessment Chart:

Thioamine Acetylase (TAA)

APPENDIX G
FINAL QUESTIONNAIRE

Please answer the following items using the scale below:

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

_____ 1. The possibility that my test results *will make me feel bad (e.g., sad, disappointed)* influenced my decision to get tested.

_____ 2. The possibility that my test results *will make me feel negatively about myself* influenced my decision to get tested.

_____ 3. The possibility that my test results *will challenge my view of myself as healthy* influenced my decision to get tested.

_____ 4. The possibility that my test results *will force me to change my daily health behavior* influenced my decision to get tested.

_____ 5. I feel that I will regret <u>not</u> learning if I am TAA deficient.

_____ 6. I feel that there is much to be gained by learning if I am TAA deficient.

_____ 7. If I am TAA deficient, I am confident that I can deal with being TAA deficient.

_____ 8. I feel that I will regret learning if I am TAA deficient.

_____ 9. If I am TAA deficient, I have the emotional help and support I need to deal with being TAA deficient.

_____ 10. I feel that I will improve my situation in some way by learning if I am TAA deficient.

_____ 11. If I am TAA deficient, there are people that I know who will help me deal with being TAA deficient.

_____ 12. I believe there will be negative consequences as a result of learning if I am TAA deficient.

LIST OF REFERENCES

Allahverdipour, H., & Emami, A. (2008). Perceptions of cervical cancer threat, benefits, and barriers of papanicolaou smear screening programs for women in Iran. *Women & Health, 47*, 23-37.

Aspinwall, L. G., Kemeny, M. E., Taylor, S. E., & Schneider, S. G. (1991). Psychosocial predictors of gay men's AIDS risk-reduction behavior. *Health Psychology, 10*, 432-444.

Babul, R., Adam, S., Kremer, B., Dufrasne, S., Wiggins, S., Huggins, M., et al. (1993). Attitudes toward direct predictive testing for the Huntington disease gene. Relevance for other adult-onset disorders. The Canadian Collaborative Group on Predictive Testing for Huntington Disease. *Journal of American Medical Association, 270*, 2321-2325.

Becker, M. H., Nathanson, C. A., Drachman, R. H., & Kirscht, J. P. (1977). Mothers' health beliefs and children's clinic visits: A prospective study. *Journal of Community Health, 3*, 125-135.

Biesecker, B. B., Ishibe, N., Hadley, D. W., Giambarresi, T. R., Kase, R. G., Lerman, C., et al. (2000). Psychosocial factors predicting BRCA1/BRCA2 testing decisions in members of hereditary breast and ovarian cancer families. *American Journal of Medical Genetics, 93*, 257-263.

Block, L. G. & Keller, P. A. (1998). Beyond protection motivation: An integrative theory of health appeals. *Journal of Applied Social Psychology, 28*, 1584-1608.

Brouwers, M. C., & Sorrentino, R.M. (1993). Uncertainty orientation and protection motivation theory: The role of individual differences in health compliance. *Journal of Personality and Social Psychology, 65*, 102-11.

Dawson, E., Savitsky, K., & Dunning, D. (2006). "Don't tell me, I don't want to know": Understanding people's reluctance to obtain medical diagnostic information. *Journal of Applied Social Psychology, 36*, 751-768.

de Wit, J. B. F., Vet, R. Schutten, M., & van Steengergen, J. (2005). Social-cognitive determinants of vaccination behavior against hepatitis B: An assessment among men who have sex with men. *Preventative Medicine, 40*, 795-802.

Dolan, N. C., McGrae McDermott, M., Morrow, M., Venta, L., & Martin, G. J. (1999). Impact of same-day screening mammography availability. *Archives of Internal Medicine, 159*, 393-398.

Floyd, D. L., Prentice-Dunn, S. & Rogers, R. W. (2000). A meta-analysis of research on protection motivation theory. *Journal of Applied Social Psychology, 30*, 407-429.

Geers, A. L. (2000). Examining the relationship between specific expectations and optimism and pessimism. *Representative Research in Social Psychology, 24*, 33-40.

Harris, C. R., Jenkins, M., & Glaser, D. (2006). Gender differences in risk assessment: Why do women take fewer risks than men? *Judgment and Decision Making, 1*, 48-63.

Hart, W., Albarracin, D., Lindberg, M., Merrill, M., Brechan, I., Lee, K. H., & Eagly, A. H. (2008). Feeling validated versus being correct? a meta-analysis of selective exposure to information. Unpublished manuscript, University of Florida.

Janz, N. K. & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly, 11*, 1-47.

Jemmott, J. B., Ditto, P. H., & Croyle, R. T. (1986). Judging health status: Effects of perceived prevalence and personal relevance. *Journal of Personality and Social Psychology, 50*, 899-905.

Lerman, C., Schwartz, M. D., Miller, S. M., Daly, M., Sands, C., & Rimer, B. K., (1996). A randomized trial of breast cancer risk counseling: Interacting effects of counseling, educational level, and coping style. *Health Psychology, 15*, 75-83.

Mann, H. B., & Whitney, D. R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *Annals of Mathematical Statistics, 18*, 50–60.

Mills, J., Aronson, E., & Robinson, H. (1959). Selectivity in exposure to information. *Journal of Abnormal and Social Psychology, 59*, 250-253.

Milne, S., Sheeran, P., & Orbell, S. (2000). Prediction and intervention in health-related behavior: A meta-analytic review of protection motivation theory. *Journal of Applied Social Psychology, 30*, 106-143.

Neuwirth, K., Dunwoody, S., & Griffin, R. J. (2000). Protection motivation and risk communication. *Risk Analysis, 20*, 721-734.

Norem, J. K. & Cantor, N. (1986). Anticipatory and post hoc cushioning strategies: Optimism and defensive pessimism in 'risky' situations. *Cognitive Therapy and Research, 10*, 347-362.

Reed, A. C., Reiter, P. L., Smith, J. S., Palefsky, J. M., & Brewer, N.T. (2010). Gay and bisexual men's willingness to receive anal papanicolaou testing. *American Journal of Public Health, 100*, 1123-1129.

Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In B. L. Cacioppo & L. L. Petty (Eds.), *Social Psychophysiology: A Sourcebook* (pp. 153-176). London, UK: Guilford.

Ronis, D. L. (1992). Conditional health threats: Health beliefs, decisions, and behaviors among adults. *Health Psychology, 11*, 127-134.

Rosenstock, I. M. (1966). Why people use health services. *Milbank Memorial Fund Quarterly, 44*, 94-124.

Scheier, M. F. & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247.

Schmiege, S. J., Aiken, L. S., Sander, J. L., & Gerend, M. A. (2007). Osteoporosis prevention among young women: Psychosocial models of calcium consumption and weight-bearing exercise. *Health Psychology, 26*, 577-587.

Smith-Klohn, L., & Rogers, R. W. (1991). Dimensions of the severity of a health threat: The persuasive effects of visibility, time of onset, and rate of onset on young women's intentions to prevent osteoporosis. *Healthy Psychology, 10*, 323-329.

Shipp, T. D., Shipp, D. Z., Bromley, B., Sheahan, R., Cohen, A., Lieberman, E., et al. (2004). What factors are associated with parents' desire to know the sex of their unborn child? *Birth: Issues in Perinatal Care, 31*, 272-279.

Sorrentino, R. M. & Short, J. C. (1986). Uncertainty orientation, motivation, and cognition. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 379-403). New York, US: Guilford Press.

Sweeny, K., Melnyk, D., Malone, W. & Shepperd, J. A. (2010). Information avoidance: A model of calculated ignorance. Unpublished manuscript, University of Florida.

van der Steenstraten, I. M., Tibben, A., Roos, R. A. C., van de Kamp, J. J. P., & Niermeijer, M. F. (1994). Predictive testing for Huntington disease: Nonparticipants compared with participants in the Dutch program. *American Journal of Human Genetics, 55*, 618-625.

Welch, B. L. (1947). The generalization of "Student's" problem when several different population variances are involved. *Biometrika*, *34*, 28–35.

Wogalter, M. S., Young, S. L., Brelsford, J. W., & Barlow, T. (1999). The relative contributions of injury severity and likelihood information on hazard-risk judgments and warning compliance. *Journal of Safety Research, 30*, 151-162.

Yabroff, K. R., Kerner, J. F., & Mandelblatt, J. S. 2000. Effectiveness of interventions to improve follow-up after abnormal cervical cancer screening. *Preventative Medicine*, *31*, 429-439.

BIOGRAPHICAL SKETCH

Wendi A. Miller is a fourth year graduate student in social psychology. In 2008, she earned a Master of Science degree in psychology from the University of Florida (Gainesville, Florida). In 2006, she earned a Master of Science degree in psychology from Augusta State University (Augusta, Georgia). She received her bachelor's degree in psychology in 2004 from William Penn University (Oskaloosa, Iowa).