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# Anti-obesity media content and its impact on people's intention to eat healthy and exercise: A test of the protection motivation theory

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**Anti-obesity media content and its impact on people's intention to eat healthy and exercise:  
A test of the protection motivation theory**

By

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A thesis submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of  
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## TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iv
LIST OF FIGURES.....	vi
ABSTRACT.....	vii
CHAPTER 1 INTRODUCTION AND STATEMENT OF THE PROBLEM.....	1
The Obesity Epidemic.....	1
Potential Causes.....	3
Obesity and the Media.....	4
CHAPTER 2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK.....	8
The Media as Sources of Health Information.....	8
Obesity in the Media.....	10
Behavior Change Models.....	12
Exposure and Attention to Obesity and Related Media Content.....	29
Hypotheses and Research Questions.....	30
CHAPTER 3 METHODS.....	32
The Sample.....	32
The Questionnaire.....	33
Variables and their Measure.....	34
CHAPTER 4 RESULTS AND DISCUSSION.....	42
Demographic Characteristics of the Sample.....	43
General Media Use Habits.....	44
Exposure and Attention to Obesity Media Content.....	45
Attitudes Toward Exercising and Healthy Eating.....	48
Behavioral Intentions.....	50
Relationship Between Exposure and Behavioral Intentions.....	51
Relationship Between Attention and Behavioral Intentions.....	52
Relationship Between Exposure and Threat Appraisal.....	53
Relationship Between Attention and Coping Appraisal.....	55
Relationship Between Threat Appraisal and Behavioral Intentions.....	57

Relationship Between Coping Appraisal and Behavioral Intentions.....	59
Relationship Between Cognitive Appraisals and Behavioral Intentions.....	61
Influence of Demographic Variables.....	63
Discussion.....	67
CHAPTER 5 CONCLUSIONS.....	70
Comparison with Other Studies.....	73
Implications of the Findings to Theory and Professional Practice.....	74
Limitations of the Study and Suggestions for Future Research.....	76
APPENDIX A: IRB Approval.....	78
APPENDIX B: Informed Consent Form.....	80
APPENDIX C: Survey Questionnaire .....	83
APPENDIX D: Study Codebook.....	93
REFERENCES.....	118

## LIST OF TABLES

	Page
Table 1	Media exposure (hours per day) by channel.....45
Table 2	Channels and programs used for health information.....46
Table 3	Average exposure (hours per day) to obesity media content, by channel.....47
Table 4	Attention paid to obesity and related media content, by channel.....48
Table 5	Minimum, maximum, and mean values for the six PMT constructs.....50
Table 6	Simple regression testing the influence of attention to non-stigmatizing, motivational obesity media content on intention to exercise.....53
Table 7	Simple regression testing the influence of attention on coping Appraisal (exercise).....56
Table 8	Simple regression testing the influence of attention on coping appraisal (diet).....57
Table 9	Simple regression testing the influence of threat appraisal on intention to exercise.....58
Table 10	Simple regression testing the influence of threat appraisal on intention to maintain a healthy diet.....58
Table 11	Simple regression testing the influence of coping appraisal on intention to exercise.....60
Table 12	Simple regression testing the influence of coping appraisal on intention to maintain a healthy diet.....60
Table 13	Multiple regression testing the influence of threat and coping (exercise) appraisals on intention to exercise.....62
Table 14	Multiple regression testing the influence of threat and coping (diet) appraisals on intention to maintain a healthy diet.....62
Table 15	T-tests showing no difference in intention to exercise and intention

	to maintain a healthy diet between gender.....	63
Table 16	ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to ethnicity.....	64
Table 17	ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to educational level.....	65
Table 18	ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to income.....	65
Table 19	Simple regression tests showing the influence of weight on intention to exercise and intention to maintain a healthy diet.....	66

LIST OF FIGURES

	Page
Figure 1	The Ordered Protection Motivation Schema (Tanner, Hunt & Eppright, 1991)....25

**ABSTRACT**

This study employed protection motivation theory (PMT) to investigate the link between anti-obesity media content, people's threat and coping appraisals, and their intentions to exercise and diet. It sought to determine whether exposure and attention to anti-obesity media content increases people's perceived levels of severity, vulnerability, response efficacy, and self-efficacy and whether these cognitive processes, in turn, affected their intention to abide by the recommended practices to offset the threat. To gather data, an online questionnaire was sent to 16,000 students and posted on Facebook to draw nonstudent respondents.

The results indicate that attention to mediated obesity and related information significantly increases people's intention to exercise as well as their overall coping appraisals (the perceived effectiveness of the recommended behaviors and their ability to perform them). Likewise, increased threat and coping appraisals were both found to significantly influence people's intention to exercise and diet. Coping (rather than threat) appraisals more strongly predicted behavioral intent. Demographic characteristics had no significant effect on behavioral intentions. Body weight, however, was found to negatively affect intention to exercise and diet.

The findings support the power of PMT constructs to predict behavioral intent, in conjunction with attention paid to mediated information. For communication professionals, the results suggest a sharper focus on presentation techniques that are able to hold audience attention longer. Medical practitioners are urged to go beyond warning patients of the probability of occurrence and the consequences of obesity and to stress information that heighten people's self-efficacy and their assessments of the effectiveness of solutions.



## CHAPTER 1

### INTRODUCTION AND STATEMENT OF THE PROBLEM

#### The Obesity Epidemic

Obesity is a term used to refer to ranges of weight that are greater than what is generally considered healthy for a given height. It also identifies ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems (CDC, 2012). As a medical condition, obesity has grown into an epidemic that has overwhelmed the American public for decades. Previous studies have shown that in a span of seven years alone, between 1991 and 1998, the rate of obesity (defined as people with a body mass index or BMI over 30) rose from 12% to 17.9% (Mokdad, 1999). The steady increase in the incidence of obesity across all states and across demographic groups continued in 1999, growing from 17.9% to 18.9%; 16 states registered obesity rates above 20% (Mokdad, 2000). More recently, a 2007 review of articles published between 1990 and 2006 found that obesity rates had increased from 13% in the 1960s to 32% in 2004 (Wang & Beydoun, 2007).

These statistics refer only to those who are obese; they do not include those who are overweight (defined as people with a BMI over 25). If this group were included, the figures become worse—66% of American adults were found to be overweight or obese in 2007, a figure that is predicted to climb to 75% by 2015. Of this number, 41% will be obese (Wang & Beydoun, 2007). More alarmingly, Wang et al. (2008) project that by 2030, 86.3% of American adults will be overweight or obese; 51.1% will be specifically obese. These percentages are based on national survey data collected between 1970 and 2004.

When it comes to children, the numbers are no better. According to the Centers for Disease Control and Prevention (CDC, 2011), childhood obesity has tripled in the past 30 years. The percentage of obese children aged 6-11 years grew from 7% in 1980 to 20% in 2008. Likewise, the obesity percentage for those aged 12-19 years went up from 5% to 18% (CDC, 2011). Complementing these statistics are the findings of a 2007 study that indicated that 16% of American children and adolescents were overweight; 34% were at risk of becoming overweight (Wang & Beydoun, 2007). The numbers continue to rise. Today, nearly one in every three American children is overweight or obese, and the numbers are even higher for ethnic minorities like African Americans and Hispanics, says First Lady Michelle Obama who spearheads the “Let’s Move” campaign (Let’s Move!, n.d.). If the problem persists, one third of all children born in or after 2000 are likely to suffer from diabetes (Let’s Move!, n.d.).

The trend in the incidence of obesity is alarming in that the complications associated with the condition are many, resulting in health and financial burdens to individuals and to society at large. Health problems include an array of chronic diseases such as cardiovascular ailments, diabetes (Mokdad, 1999), hypertension, asthma, angina, lung disease (Sturm, 2002), certain cancers (Mayo Clinic, 2011; Let’s Move!, n.d.), and premature death (Cecchini et al., 2010). The financial costs are real. Sturm (2002) found obesity to be “associated with a 36% increase in inpatient and outpatient spending and a 77% increase in [the cost of] medications” (p. 245). Wang et al. (2008) project that “total health-care costs attributable to obesity and [being] overweight will more than double every decade. By 2030, health care costs...could range from \$860 to \$956 billion, which would account for 15.8%-17.6% of total health care

costs, or for one in every six dollars spent on health care” (p. 2,329). All factors considered, the effects of obesity are devastating.

A proper diet is recommended to combat obesity. Eating healthy foods is one way to cut fat. Recently, the United States Department of Agriculture has released new guidelines regarding the recommended daily intake of each food group (U.S. Department of Agriculture, n.d.). The diagram prescribes portion sizes for children, teens, and adults.

Experts recommend a combination of a healthy diet and exercise to fight obesity. In her *Let's Move!* campaign, Michelle Obama advocates for both healthy eating and staying active. According to the CDC (2011) and the National Library of Medicine of the National Institutes of Health (MedlinePlus, 2011a), adults should exercise for 30 minutes per day at least five days a week. Children should exercise for 60 minutes per day (*Let's Move!*, n.d.).

Aside from being able to maintain a healthy weight, exercising can alleviate and prevent certain diseases like Type 2 diabetes, cardiovascular diseases, cancer, stroke, metabolic syndromes, depression, and arthritis. Exercising also improves mood, boosts energy, promotes better sleep, and puts the spark back into sex lives (Mayo Clinic, 2011).

### **Potential Causes**

Why is obesity a persistent problem in the U.S.? The *Let's Move!* campaign suggests that one reason involves the quality and quantity of food ingested. In the past, children ate reasonable portion sizes of home-cooked meals, often with vegetables. Today, meals are often picked up from the nearest fast food restaurant on the way home from work, school, or sport activity. Snacks are no longer a once-a-day ritual; instead, most children have three, and some have up to six snacks per day. Food portions are two to five times greater than they were years

ago (Let's Move!, n.d.). Indeed, according to Rolls (2003), large portions are contributing to the obesity epidemic.

Obesity also results when people adopt less active lifestyles. Before, children used to “walk to and from school every day, run at recess, participate in gym class, and play for hours before dinner” (Let's Move!, n.d., par. 2). Today, kids ride in a car, a bus, or take the subway to school. Recesses are cut in favor of more classroom time. Gym classes are either optional or non-existent. After-school activities now take place indoors. Children and adults alike do not spend nearly as much time being active as they did in the past.

People now have greater access to health information from online and traditional media sources. In these channels, public service advertisements advocate for healthy lifestyles. Numerous publications are dedicated to health, and health-related stories are all over the mass media. Despite the availability of information to combat obesity, many are still not exercising and eating as healthy as they should be.

Do people find health-related information in the mass media useful? Do they use it to inform their decisions to adopt healthy behaviors such as eating healthy and exercising? This study investigated the link between exposure and attention to mass media anti-obesity content and people's intentions to practice the behaviors recommended to solve the problem.

### **Obesity and the Media**

Efforts to prevent, control, and reverse obesity have not been successful despite the plethora of reliable and influential sources of information regarding health-related topics. Others, however, are increasingly making use of these information sources. Statistics from the National Health Interview Survey show that 45.6% of adults over the age of 18 looked up health

information on the Internet within the last year (CDC, 2010). According to the Capstrat-Public Policy Poll (2010), 74% of those surveyed perceived talks with medical doctors as the most reliable source of health information, but a significant portion, some 59%, also believe Google searches produce reliable content. Another 22% find Google searches influential, second only to talks with a doctor, which 44% found to be most influential. Authors point out that over time, one-on-one conversations with medical practitioners are becoming more rare, making the mass media (traditional and online) the public's primary sources of information about issues that affect their lives. The National Library of Medicine confirms that people acquire information regarding health-related topics from media outlets such as television, the Internet, and the radio (MedlinePlus, 2011b). Of these channels, media or information service companies (e.g., *Dr. Oz*, *The Doctors*, iVillage, and WebMD) make up 56% of the sources people use, while government organizations (e.g., the CDC and the FDA) and companies that produce health products (e.g., Johnson & Johnson and the MayoClinic) make up only 16% each (PwC, 2011). Adolescents retrieve considerable information from online sources. A survey of 452 young adults indicated that they learn about health mostly from television, followed by radio, print, the Internet, and social networking media (Lariscy, Reber & Paek, 2010).

To investigate the link between media content and health behavior, the present study applied the tenets of the protection motivation theory (PMT). This model asserts that the higher the perception of threat, the more likely a person is motivated to change behavior as long as the response or coping strategy is seen as effective in reducing that threat (Beck, 1984; Courneya & Hellsten, 2001). According to this theory, people respond to persuasive communication via cognitive processes that fall into two categories: threat appraisal and coping

appraisal (Courneya & Hellsten, 2001; Milne, Orbell & Sheeran, 2002; Plotnikoff et al., 2009; Tulloch et al., 2009). *Perceived severity*, one's perception of how serious the consequences of the health problem are, and *perceived vulnerability*, a person's perception of the likelihood of contracting or developing the condition, combine to form a person's *threat appraisal* (Courneya & Hellsten, 2001). Response efficacy and self-efficacy make up a person's *coping appraisal* of the situation. *Response efficacy* is the perceived effectiveness of the suggested action or behavior in treating or combating the problem. *Self-efficacy* is a person's belief in his or her ability to perform the recommended response action (Courneya & Hellsten, 2001).

A number of studies that tested this theory used experimental designs (e.g., Milne, Orbell & Sheeran, 2002). The present study, however, employed a survey to investigate how anti-obesity media content influences people's intentions to exercise and follow a healthy diet. The survey method was employed because the study aims to determine the role of two communication variables, exposure and attention to obesity and related media content, in the protection motivation theoretical framework. The preponderance of messages about this topic in the general media offers an opportunity to expand the framework to include the impact of these two communication variables.

The results of this study are intended to inform health practitioners, health researchers, and communication strategists about better ways of informing the public about how to curb obesity. The findings are expected to assist them in determining the best channels and/or media mix to reach different audience segments. By ascertaining what motivates people to protect themselves from the risks related to obesity, health communication experts are able to design messages that can induce healthy behavioral changes; messages that enhance people's

belief that they can perform the recommended action can be identified and crafted accordingly.

## CHAPTER 2

### LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This study aimed to determine the extent to which media content about obesity influences people's intentions to exercise and follow a healthy diet. This chapter discusses studies that examined the mass media as sources of health information. It focuses on the media's portrayals of obesity, a long-standing part of the press agenda. It also provides an overview of behavior change models used to study health-related decision-making before describing protection motivation theory (PMT), the framework that guided the analysis. The hypotheses and research questions are listed at the end of the chapter.

#### **The Media as Sources of Health Information**

People make everyday decisions informed by their knowledge of science and science-related matters. But where do people get the scientific information on which they base their decisions? It has long been known that people seek information from a variety of sources. According to a National Science Foundation study (NSF, 2010), 47% of Americans get their current events information from television more so than any other source. The Internet and newspapers are also significant contributors, with 22% and 20% of Americans reporting them as main sources of current news and events information (NSF, 2010). Their primary sources of science and technology information differ slightly. Television still tops the list, followed by the Internet. The study's sample, however, reported that the Internet, magazines, books, and other print materials are more commonly used as sources of science and technology information than as sources of current news and events (NSF, 2010).



In addition, the use of the Internet versus television as a source of general news and science and technology information differs among demographic groups. Younger people tend to use the Internet more, and this trend increases with education and income (NSF, 2010). Television use is more popular among older audiences, and decreases with education and income (NSF, 2010). Despite these differences, it can be said that mediated sources, however diverse, remain the primary sources of news and information.

When it comes to the topic of health, Americans also generally rely on mediated sources. Colby et al. (2011), surveying a random sample of 437 Americans, report that when receiving information on health and health-related topics, 28.3% of their sample favored the Internet, 26.4% referred to newspapers, and 22.3% resorted to the postal service (Colby et al., 2011). Generally speaking, older people depend on newspapers, while younger people prefer the Internet as a source of information for health-related topics. Those who are obese prefer the mail (Colby et al., 2011).

Beaudoin & Hong (2011) analyzed data from a national telephone survey of 700 adult (age 18 and older) Americans conducted in 2007 and discovered a dramatic rise in health information seeking via the Internet—62% reported having sought information online, a habit reported by youngsters, women, and those with higher education. Television also figured prominently as a health information source, with 64% reporting they get health information primarily from TV. Non-whites were the most common users of this medium. Newspapers were the choice of older, highly educated, and non-white individuals (Beaudoin & Hong, 2011).

Of these available media channels, television and its effects on unhealthy eating habits has been the subject of considerable debate. The Council on Communications and Media (2011)

cites multiple studies linking television viewing to obesity, but the findings are mixed. Some report a decline in physical activity (including exercising) with increased TV viewing; others did not (Council on Communications and Media, 2011). Beaudoin & Hong (2011) found no effect of mass media exposure on physical activity, but reported that media exposure did significantly predict fruit and vegetable intake, unhealthy snacking, and soft drink consumption. They also note that newspaper reading has a strong association with increased intake of fruits and vegetables and unhealthy snacks. Soft drink consumption increased with television viewing, but the relationship was not causal. Moreover, information seeking via the Internet did not correlate with performing more physical activity and healthier eating habits (Beaudoin & Hong, 2011).

### **Obesity in the Media**

The findings of these foregoing studies suggest a more in-depth examination of how obesity and those who suffer from it have been portrayed in the mass media. Medical surveys reveal that the problem is more acute in developed countries. At least half of the population in 13 high-income countries has been reported to be overweight or obese (O'Hara et al., 2011). Experts say this phenomenon can be attributed to factors that are both personal and social (Barry et al., 2011; Heuer, McClure & Puhl, 2011; Kim & Willis, as cited in Ries, Rachul & Caulfield, 2011). An analysis of mass media depiction or portrayal of obesity conducted by Kim and Willis (2007) indicate that before 2004, obesity was blamed on factors that are largely personal, with poor eating habits being cited most often. Lack of exercise and modern (sedentary) lifestyles were also mentioned. After 2004, however, the problem began to be attributed to social factors, such as the habits of peer groups, family eating patterns, and other

influences in a person's social environment. Specifically, news articles saw an increase in blaming societal factors and a decrease in the assignment of blame to personal factors. Barry et al. (2011) also found evidence in national and regional news media outlets for both personal- and industry-level causes of childhood obesity. Heuer, McClure & Puhl (2011) analyzed five major news websites and discovered that victim-blaming is still very much alive.

Such portrayals, according to Ries, Rachul & Caulfield (2011), can shape people's understanding of this disease (its causes and its treatment) and the consequent actions people take to combat the threat. They can also influence people's notion of obese individuals as well as their attitudes toward obesity as a health condition. In an experiment conducted by McClure, Puhl & Heuer (2011), participants were shown photographs of adult Caucasian obese women presented in negative or positive frames. Negative frames included those in which the women were seen engaging in stereotypical unhealthy eating habits (e.g., eating junk food) or in unflattering appearances (e.g., photographed from behind, emphasizing their large body size). Photographs with positive frames depicted obese women performing healthy practices (e.g., exercising) or having flattering appearances (e.g., dressed nicely). Those who saw the negatively framed photographs reported *more* negative attitudes toward obese people than those who saw the pictures with positive frames. In addition, the participants thought that obesity results from overeating and from people's general belief that being overweight does not constitute a health problem. In other words, they did not see being obese as natural.

In a content analysis of photographic media coverage, Heuer, McClure & Puhl (2011) found that media portrayals of obese individuals were more likely to be negative. Sixty-seven percent of the 549 photographs the authors analyzed contained overweight or obese

individuals; 72% of these had negative or stigmatizing portrayals of obese persons. The authors lament this practice, arguing that “weight stigma is not a beneficial tool for motivating weight loss. Weight stigma is counterproductive for public health and increases the likelihood of [performing] unhealthy eating behaviors, avoidance of physical activity, impaired weight loss efforts, and decreased use of preventive health services” (p. 975).

Studies that have explored obesity in the media have typically focused on negative news coverage and how the disease has been portrayed in mainstream programs and advertising, mostly those that promote fast food and “junk food” (Barry et al., 2011; Heuer, McClure & Puhl, 2011; McClure, Puhl & Heuer, 2011; Ries, Rachul & Caulfield, 2011; Vandewater & Denis, 2011). Little attention has been paid to anti-obesity media content that does not stigmatize being overweight but promotes healthy living.

### **Behavior Change Models**

The task of getting people to eat healthy and to exercise is a daunting one. Changing “people’s food habits can be an intervention into their culture, society, and relationships” (Carter et al., 2011, p. 466). Changing the way people think about and act out their preferences in food and physical activity has been the subject of intense scientific scrutiny. How do people decide to abide by the general recommendations of how to prevent obesity? Several theoretical models have been proposed to explain the mechanisms of behavioral change especially along the lines of performing protective health behaviors. Of these models, six stand out as having the greatest explanatory power. According to Purdie & McCrindle (2002) and Baranowski et al. (2003), these are (1) the transtheoretical model of behavior change, (2) the precaution adoption process model, (3) the social cognitive theory, (4) the theory of planned

behavior, (5) the health belief model, and (6) the protection motivation theory. These models and theories see behavior change as a product of a series of stages that often begin with awareness of the threat or the unhealthy condition. Because stages are qualitatively distinct, people at different stages are thought to show different patterns of behavior. For example, they may differ in their interest in information or in their resistance to recommendations. A stage perspective also suggests that the variables important at one point in the process are not necessarily important at another. The factors that lead someone to decide to act, for instance, may not be the ones that determine whether that decision is actually carried out. According to stage-based theories, interventions need to be tailored to the status of their intended audience, focusing on the specific barriers that inhibit the transition to the next stage and changing over time as the audience progresses from stage to stage.

**The transtheoretical model of behavior change.** As the name suggests, this model brings together multiple concepts and theories in the field of clinical psychology (Baranowski et al., 2003) originally intended to explain smoking addiction (Baranowski et al., 2003; Purdie & McCrindle, 2002). Developed by Prochaska, DiClemente, Velicer, and their colleagues (Prochaska & DiClemente, 1983, 1985; Prochaska et al., 1991), this model advances that different cognitive states are important at five stages: precontemplation (no intention to change), contemplation (thinking of changing), preparation (developing a plan), action (doing the changed behavior), and maintenance (after six months of change) (Baranowski et al., 2003). In addition, other variables are proposed to influence how people progress through the five stages.

An underlying assumption of this framework is that people change their behavior to attain desirable effects and to avoid negative effects. That is, changes in cognition (the pros and cons) initiate behavior change. If a change in behavior seems more positive than a current behavior, a move between the first two cognitive stages is likely to ensue. The actual performance of healthy habits typically pushes the individual from the second stage to the third. The key factor in actual change (stage four) is self-efficacy, or one's perceived ability to perform the behavior successfully. The factors contributing to the move from stage four to five are still unclear (Baranowski et al., 2003).

This model has been lauded for its ability to prescribe intervention strategies at each stage (Purdie & McCrindle, 2002). Investigators can judge a person's current pro and con attitudes as well as his or her level of self-efficacy, determine which to target, and "provide messages that attempt to change the belief" (Baranowski et al., 2003, p. 325). A potential weakness of the model comes from Bandura (1986), who claims that the stages are arbitrary, whereas cognition is a continual process.

In line with the present study, the model has been used to analyze the propensity to eat healthy and engage in physical activity, but the results have been inconclusive, prompting a call for more standardization of constructs" (Baranowski et al., 2003, p. 325). Indeed, the divergent processes involved in maintaining a healthy diet and exercising regularly challenge the applicability of this model. Useful here, however, is the fact that it assigns an important role to self-efficacy in eliciting the desired behavior (Baranowski et al., 2003). Also valuable in the context of this research are the studies utilizing this approach which have found empirical evidence that exposure to messages that induce a change in perceptions also result in changes

in behavior, strongly suggesting that media messages could influence one's intention to follow a healthy diet and exercise.

**The precaution adoption process model.** This model adopts a “dynamic perspective because of its emphasis on the development over time of the beliefs and intentions that lead to action” (Weinstein, 1988, p. 356). The core of Weinstein's (1988) model is a sequence of five stages: “unaware of the issue,” “aware of the issue but not personally engaged,” “engaged and deciding what to do,” “planning to act but not yet having acted,” and “acting.” If the conclusion of the decision-making stage is that action is not needed, this outcome represents an additional stage, although not a stage along the route to action. The seventh stage, “maintenance,” indicates the repetitions that may be required after preventive actions are performed. Maintenance is not a problem when actions need not be continued over time, but it is certainly an important consideration for lifestyle changes that are difficult to maintain.

In order to move from one stage to the next, a person must accumulate the desired conditions or outcomes specified in each stage. The model subscribes to the notion that the forms of intervention and information necessary to move people to action will depend on which stage the person is in (Weinstein, 1988).

The first three stages of the precaution adoption model are “defined in terms of beliefs people hold about the risk situation” (Weinstein, 1988, p. 359), which lead to their perception of susceptibility. First, people must be aware that the health issue exists and that they are susceptible to it. Factors contributing to the move from stage one to stage two include communications about the hazard, both from the media and from other people, as well as

experience with the hazard. Next, people move to stage three, in which they become engaged but are still deciding what to do about the issue.

People progress to stage three only upon acknowledging their personal susceptibility or upon realizing that “there is a real chance [they] could have the health problem” (Weinstein, 1988, p. 360), also called “engagement” (Purdie & McCrindle, 2002). The factors contributing to a move from stage two to three are experience with the hazard and the “credibility and clarity of communications about prevalence” (Weinstein, 1988, p. 360). Influencing the move to stage three are “risk factor information, personalized risk information, [and] information about peers’ status on risk factors” (Weinstein, 1988, p. 360). However, with more information comes the possibility of moving backward between stages (Weinstein, 1988).

After the “stages of belief” comes stage four, coined “commitment” by Purdie and McCrindle (2002). Movement to this stage “cannot occur until people have reached the final stages of all three relevant beliefs: susceptibility, severity, and precaution effectiveness” (Weinstein, 1988, p. 365). That is, a person must believe there is a personal risk, that having or contracting the health issue has negative consequences, and that performing the precautionary action will have positive effects before progressing to stage four. Also important is the understanding that deciding to act can be reversed (Weinstein, 1988). However, when deciding to act, there is already an intention to do so.

Moving to stage five, called “change” by Purdie & McCrindle (2002) or “takes precaution” by Weinstein (1988), requires the activation of self-regulatory processes, which come into effect with the formation and strengthening of intention. Factors influencing one’s adoption of this stage are “complexity of precaution; ease of obtaining information required to



carry out [the] precaution; time, effort, and resources required by [the] precaution; time, effort, and resources available considering competing life demands; time until hazard appears; opportunities that decrease [the] costs of acting; reminders of [the] threat; [and] reminders to take precaution” (p. 369). The move from intention to action is a difficult one, as pointed out by Leventhal (1970) and Leventhal et al. (1983), who found that “even when people are convinced that action is desirable and even when information about the precaution *seems* available, the effort required to get that information can be great enough to inhibit preventive action” (Weinstein, 1988, p. 378).

This model differs from the transtheoretical approach in three ways. First, the “precontemplation” stage in the precautionary model includes both people who have never thought about the desirability of changing their behavior and people who, after thinking about the issue, have concluded they do not wish or need to change. A second difference is that the “contemplation” category may include both individuals who are undecided about action and those who have already decided to act. A final difference between the two models is the added initial stage in which people are simply unaware of the issue.

The precaution adoption model accounts for “situational barriers” and their influence on the ability and prevalence of behavior change (Purdie & McCrindle, 2002). Purdie & McCrindle (2002) explain the potential usefulness of this model when studying older adults, taking into consideration cognitive overload and other barriers. Of particular use for this study were Purdie & McCrindle’s (2002) findings that other demographic characteristics can be barriers to performing recommended behaviors. In addition, the model highlights the influence and importance of mediated information on one’s movement through the various stages of

behavior adoption. Finally, the model accepts the conditions of susceptibility and severity as being required before moving to subsequent stages; this again, is in line with the current study's use of protection motivation theory.

**Social cognitive theory.** Social cognitive theory posits that knowledge can be acquired by observing others in social interactions in real life and in the media. This theoretical framework derives from the work of Bandura (1976) who argued that the “development of self-regulation is related to personal, environment, and behavior factors that operate separately but interdependently” (Purdie & McCrindle, 2002, p. 382). Baranowski et al. (2003) agree, saying that behavior is a function of the person and the environment, which are “in constant reciprocal interaction” (p. 295).

The personal aspects involved in behavior proposed in this model are skills, self-efficacy, and outcome expectancies; the environmental factors include modeling and availability (Baranowski et al., 2003). In this case, modeling refers to learning behavior by watching someone do it and receiving reinforcement from doing so (Baranowski et al., 2003). In this model, the primary factor in changing behavior is self-control, which is achieved by setting one's own goals, monitoring behavior, rewarding one's self when goals are achieved, and problem-solving and decision-making when goals are not met (Baranowski et al., 2003). Motivation for change comes from “outcome expectancies”: people want positive results, and they want to avoid negative outcomes (Baranowski et al., 2003).

The theory is manifested in the following process. When a new behavior is more attractive and less negative than a former behavior, a person is motivated to try the behavior. Whether the person actually performs the new behavior relies on his or her perceived self-

efficacy (Baranowski et al., 2003). If successful, self-efficacy is reinforced, and the person is more likely to perform the behavior again; if unsuccessful, the person will likely engage in problem-solving and decision-making procedures (Baranowski et al., 2003). Throughout the process, the person can learn self-control skills, “in which increasingly more difficult behavioral change goals are set, progress toward goal attainment is monitored, and success in goal attainment is rewarded” (p. 295).

Research using this model has centered on the development of nutrition education interventions. Such studies evaluate outcome expectancies and self-efficacy related to maintaining a healthy diet, with findings indicating greater perceived health outcomes from eating a variety of foods among men than women (Baranowski et al., 2003). In all studies, self-efficacy and intention were both predictors of changes in eating habits (Baranowski et al., 2003). This implies that greater perceived self-efficacy is tied to greater intention to change and abide by the recommended practices. These implications bear weight in the current study due to the support for higher perception of self-efficacy leading to great intention to follow a healthy diet. This contention aligns with a particular tenant of protection motivation theory.

**The theory of planned behavior.** This theoretical formulation states that people make rational decisions based on their beliefs about behaviors and their consequences (Purdie & McCrindle, 2002). It represents Ajzen’s (1985, 1988, 1991) modification of Fishbein & Ajzen’s (1975) theory of reasoned action, adding “perceived behavior control” (similar to self-efficacy) into the equation in order to explain difficult behaviors. Specifically, the model posits that people’s attitudes toward behaviors, perceived social norms, and behavioral control serve to

influence people's intention to act. Intention, in turn, influences behavior, with stronger intentions causing a higher likelihood of performance (Ajzen, 1991).

Intentions and perceived behavior control have important roles in the prediction of behavior; however, these vary across contexts and situations. When the situation is voluntary, intentions alone should predict behavior, but when the situation is not controlled, perceived behavior control becomes increasingly important.

A review by Godin & Kok (1996) found the theory of planned behavior used in various health fields (e.g., addictions, automobiles, clinical settings, AIDS, diet, exercise, and oral hygiene). However, the "efficiency of the theory varied across health behaviors," (Purdie & McCrindle, 2002, p. 381). Due to variations in results and the theory's focus on predicting behavior, its usefulness in this study was limited to its position regarding perceived behavior control and intentions. That is, although the present study did not intend to predict behavior, the notion that perceived behavior control (self-efficacy) is a significant factor contributing to one's intentions to take action was highly pertinent in the current investigation.

**The health belief model (HBM).** Developed by Rosenstock in 1966 to study and promote the uptake of health services, the model was expanded by Becker and colleagues in the 1970s and 1980s. Subsequent amendments to the model were made as late as 1988 to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions play in personal responsibility (Ogden, 2007). The HBM suggests that one's belief in a personal threat and belief in the effectiveness of the proposed behavior will predict the likelihood of performing that behavior (Rosenstock, Strecher & Becker, 1988).

This model has four components: perceived susceptibility to a health threat, perceived severity of the threat, perceived benefits of the behavior change, and perceived barrier to behavior change. It also takes internal and/or external cues to action and the level of available social support into consideration when making a decision regarding the course of action to take (Purdie & McCrindle, 2002). The model was developed to respond to public health issues (Baranowski et al., 2003) and was used “in investigations of compliance with public health programs” (Purdie & McCrindle, 2002).

Studies utilizing this framework have found the level of perceived threat or risk to be the “primary motivation to change” and self-efficacy to be the “primary resource for change.” The model suggests that people obtain certain cues, triggering a perception of threat, and then select a modifying behavior to lessen the threat. The choice of which action to take results from a consideration of perceived benefits, perceived barriers that can be overcome, and the person’s confidence in performing the behavior (Baranowski et al., 2003).

Because the list of cues with the potential to influence one’s behavior is long and unpredictable, little research has addressed this area. However, studies have found that internal cues have a higher influence on one’s behavior change. Next in line as a substantial predictor of behavior is information from a physician regarding medical testing. The results are mixed, indicating that people do not accurately rate the importance of a cue (Baranowski et al., 2003). Other literature utilizing this framework has found results in opposition to the proposed model. Specifically, Humphries & Krummel (1999) found women’s “perceived susceptibility to cardiovascular disease or high blood cholesterol levels was not related...to an intention to

change their diets” (Baranowski et al., 2003, p. 285). Thus, the theory’s predictions have not been confirmed.

In the context of this study, the health belief model supports the idea that perceived severity and self-efficacy have important roles in influencing one’s motivation to practice healthy behaviors.

**Protection motivation theory (PMT) and the ordered protection motivation model (OPM).** Rogers (1983) developed protection motivation theory as an adaption to Lazarus’ (1968) primary and secondary appraisal process model (Tanner, Hunt & Eppright, 1991). According to Tanner, Hunt & Eppright (1991), the model “provides a clearer prescription for how to develop messages that can influence adaptive behavior” (p. 37). More specifically, PMT is a structural model that assists in understanding health intentions via persuasive communication tools, specifically those that are fear-arousing (Scarpa, 2011), although fear may not necessarily need to occur to influence behavior (Tanner, Hunt & Eppright, 1991). The model posits that those with a higher perception of threat will be more motivated to change, if the coping strategy offered is effective in reducing the threat (Beck, 1984; Courneya & Hellsten, 2001). Thus, two categories of appraisals make up PMT: threat and coping (Courneya & Hellsten, 2001; Milne, Orbell & Sheeran, 2002; Plotnikoff et al., 2009; Tulloch et al., 2009). Perceived severity and perceived vulnerability constitute threat appraisal, while response efficacy and self-efficacy comprise the coping appraisal part of this model (Courneya & Hellsten, 2001; McGowan & Prapavessis, 2010; Milne, Orbell & Sheeran, 2002; Plotnikoff, Rhodes & Trinh, 2009; Plotnikoff et al., 2009; Tulloch et al., 2009).

This model was appropriate for the current study because it takes tenets from the previously mentioned theories and incorporates them into one, all-inclusive, framework. That is, it does not just consider the severity of the issue, nor does it focus exclusively upon one's perceived self-efficacy in determining behavior intentions. Likewise, because the focus here was on mediated messages, PMT fit: at its core is the idea that people respond to persuasive media messages. The original model does have limitations, however, leading to the adapted model (OPM) that also serves as the foundation for the present study (Tanner, Hunt & Eppright (1991).

Tanner, Hunt & Eppright (1991) sought to improve the model in four ways. First, rather than de-emphasizing the emotions involved, the authors emphasized this component. Second, they suggest that appraisal mechanisms are sequential. Third, the improved model elucidates maladaptive coping behaviors. And finally, they introduce the social context of danger into the model because adaptive behaviors are influenced by norms.

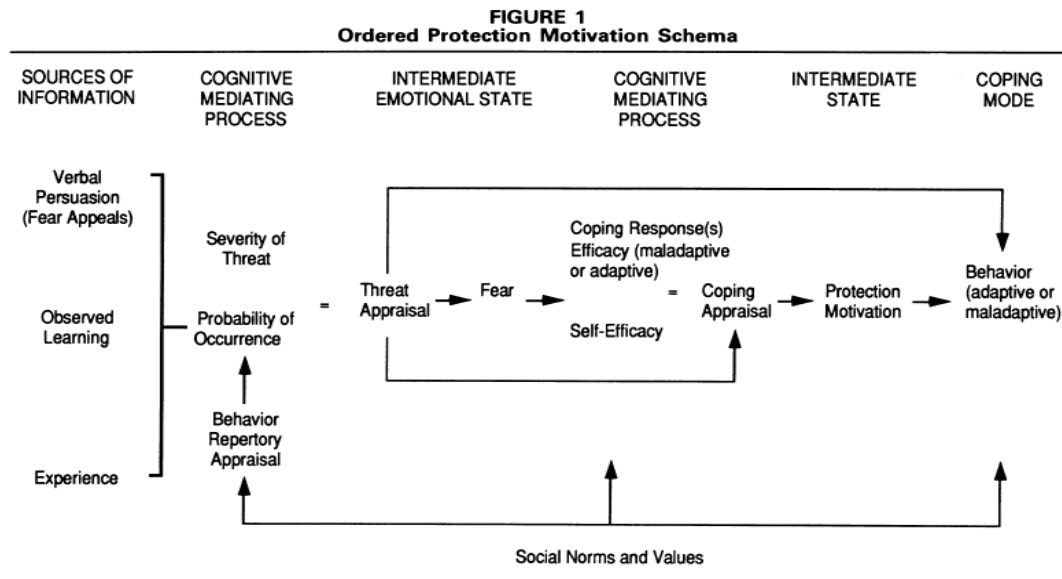
Rippetoe and Rogers (1987) have found that fear does not directly incite a change in behavior and should thus be treated as a by-product of threat appraisal (Tanner, Hunt & Eppright, 1991). However, because the assumption is that cognitive appraisals facilitate persuasion, it is important to consider emotions triggered by fear-arousing messages. That is, fear appeals trigger emotional responses, emotion encourages engagement or cognitive processes, and these, in turn, influence behavior. Therefore, despite the fact that fear does not directly cause change, audiences are still likely to continue processing fear appeals or threat-related information, with the potential to lead to adaptive behavior (Tanner, Hunt & Eppright, 1991).

Rogers' (1983) original protection motivation model was a parallel or unordered sequence of appraisal processes. However, Scherer (1984, 1988) has found differently, saying appraisals are more likely to occur sequentially, following Lazarus' (1968) primary (threat) and secondary (coping) appraisal model. As Lazarus (1968) suggests, it is expected that threat information prompting threat appraisal should precede coping information that prompts coping appraisal (Tanner, Hunt & Eppright, 1991). Other evidence for the OPM model is the finding "that fear may change attitudes but not behavior (e.g., Dembroski, Lasater & Ramirez, 1978; King & Reid, 1987; Mason, 1985; Mausner & Platt, 1970; Schwarz, Servay & Kumpf, 1985). These studies did not manipulate coping efficacy and found that fear changed one's attitude toward the threat but not one's behavior (Tanner, Hunt & Eppright, 1991).

The model assumes that threat appraisal leads to fear, or fear is created by threat appraisal, when perceived severity and vulnerability are high, although it is possible that other factors could evoke fear. In addition, OPM requires fear before coping can occur (Tanner, Hunt & Eppright, 1991). That is, threat appraisals must lead to fear in order for coping appraisals to occur. Rogers (1983) does not believe fear to be necessary. The question then, is whether one will enter into coping appraisals without feeling fear from threat appraisals. As Tanner, Hunt & Eppright (1991) point out: In the OPM model, "the emotional state of fear is hypothesized to increase attention and believability, and should ultimately increase the likelihood of engaging in the coping appraisal" (p. 38). The ordered protection motivation schema is diagrammed in Figure 1.



Figure 1. The Ordered Protection Motivation Schema (Tanner, Hunt &amp; Eppright, 1991)



Another limitation of the original model is its assumption that people have not already adopted coping responses to threats. Coping behaviors seek to lessen threat and/or fear; however, behaviors that reduce fear without diminishing threat are called maladaptive behaviors or maladaptive coping behaviors. The adoption of this kind of behavior depends greatly upon experiences (Tanner, Hunt & Eppright, 1991). For instance, Tanner, Hunt & Eppright (1991) describe the work of Kantrowitz et al. (1987) who found sexually active college students judging their ability to choose STD-free partners based on past success.

Studies by Leventhal, Singer & Jones (1965) support the influence of maladaptive behaviors on appraisal processes and has revealed the difficulty in convincing at-risk groups to adopt appropriate coping strategies (Weinstein, 1988). This may be due in part to the strong maladaptive behaviors people have used in previous threatening situations. In other words, in addition to the four cognitive processes used to appraise threat, people also look to the current behavior performance of coping responses (Tanner, Hunt & Eppright, 1991). If maladaptive

behaviors have worked in the past, people are likely to use them again despite their inability to lessen the threat.

The protection motivation model suggests that when a threatening message arouses fear in a person, he or she appraises the threat and evaluates potential coping responses. If the coping response is deemed effective, it should then be adopted. However, in certain contexts, this does not occur due to social influences and pressures (Tanner, Hunt & Eppright, 1991). An example concerns condom use. While this behavior decreases the threat and fear of contracting a sexually transmitted disease, people do not always use condoms because of perceived social implications. The practice implies that one partner has a disease; thus, one might be reluctant to use a condom. This results in the search and adoption of alternative, although perhaps maladaptive, behaviors (Tanner, Hunt & Eppright, 1991). This and other situations highlight the importance and influence of social norms on one's decision-making process.

**Studies that have applied PMT.** Many who have applied this framework to evaluate motivation and intention to practice health recommendations use experimental designs (e.g., Courneya & Hellsten, 2001; McGowan & Prapavessis, 2010; Milne, Orbell & Sheeran, 2002; Plotnikoff, Rhodes & Trinh, 2009; Santonja et al., 2012; Zhang & Cooke, 2012). A number of these experiments involve splitting participants into groups (including a control) and presenting them with articles manipulated in ways that make specific PMT variables more or less salient (e.g., Courneya & Hellsten, 2001; McGowan & Prapavessis, 2010; Plotnikoff, Rhodes & Trinh, 2009; Santonja et al., 2012; Zhang & Cooke, 2012). After exposure to the experimental stimuli, participants complete questionnaires concerning their intentions to, for example, take

preventative measures against colon cancer (Courneya & Hellsten, 2001; McGowan & Prapavessis, 2010), become and stay physically active after hospitalization (Plotnikoff, Rhodes & Trinh, 2009), or become physically active to promote overall health (Santonja et al., 2012; Zhang & Cooke, 2012). Other experimental studies combine PMT interventions with volitional interventions to gauge intention to follow a recommended behavior (Milne, Orbell & Sheeran, 2002; Zhang & Cooke, 2012).

The findings of these experiments show support for PMT; however, the ways in which the four components of PMT interact differ between studies. Courneya & Hellsten (2001) found that individuals with a greater perceived level of severity and a high degree of response efficacy were more motivated than those with a low level of perceived severity despite the constant high degree of response efficacy. Plotnikoff, Rhodes & Trinh (2009) found increases in motivation in relation to increases in severity and response efficacy; self-efficacy also played a more substantial role. In McGowan & Prapavessis (2010), participants who exhibited higher perceived vulnerability, response efficacy, and self-efficacy showed higher motivation. In short, *motivation* and *intention* to act increased in all cases.

Behavior change is more difficult to predict. Plotnikoff, Rhodes & Trinh (2009) did find significant correlations between intention and behavior, supporting Ajzen & Fishbein's 1980 assertion that intention predicts behavior (see also Plotnikoff & Higginbotham, 1998 and 2002; Plotnikoff, Rhodes & Trinh, 2009).

Other studies have applied the PMT to analyze survey data, asking questions of people suffering from health conditions like Type 2 diabetes (Plotnikoff et al., 2009) and coronary

artery disease (Tulloch et al., 2009). Both studies used questionnaires to assess the four PMT variables. Some have also used surveys to gauge behavioral actions at later dates.

In the model, self-efficacy is a critical variable. Plotnikoff et al. (2009) found self-efficacy to be the strongest predictor of physical activity and behavioral intention. Unlike the results of experimental studies, threat appraisals (severity and vulnerability) had no significant effect on intention to perform more physical activities. On the other hand, Tulloch et al. (2009) found that self-efficacy, response efficacy, and perceived severity predicted intention to exercise, which, in turn, predicted behavior. However, this was only reliable at six month testing, not at twelve months. In short, PMT was supported for the short-term, but not for the long-term (Tulloch et al., 2009).

Results from a survey of corporate workers indicated support for PMT in the short term, but other factors contributed to the long-term success with physical activity (Rhodes, Plotnikoff & Courneya, 2008). Researchers grouped participants into five profiles according to their answers. Those who intended to exercise differed from those who did not in their perceived importance and concern for physical activity. Because concern, a subset of fear, was seen as part of threat appraisal, it is hypothesized as having an influence on intention. Those successful in adopting behavior were distinguished by their self-management and self-regulation ability (similar to self-efficacy). In this study, adoption referenced the short term, whereas maintenance continued into the long term. Control of constraints is what set successful maintainers apart from those who are unsuccessful (Rhodes, Plotnikoff & Courneya, 2008).

Most experimental studies show that threat appraisal works with coping appraisal to increase intention to perform healthy behaviors. Survey data, however, fail to support this

contention (Plotnikoff et al., 2009). Instead, survey data seem to have mixed results. One finding indicates that coping appraisals influence intention (Plotnikoff et al., 2009). Another found support for both coping and threat appraisals having influence on intention (and subsequently, behavior) (Tulloch et al., 2009). Still another indicates that threat appraisal is most influential in changing behavioral intentions, but self-efficacy, a part of coping appraisal, influences the adoption of prescribed behavior (Rhodes, Plotnikoff & Courneya, 2008).

### **Exposure and Attention to Obesity and Related Media Content**

This study considers the influence of exposure and attention to anti-obesity media content on the constructs that compose the PMT framework. Most studies have shown differences in the influence of these two variables on the learning and comprehension of health messages.

Shim et al. (2006) define exposure as “information that is gathered incidentally from sources in the environment” (p. 158). Drawing on this definition, Tian & Robinson (2009) conducted a secondary analysis of the Health Information National Trends Survey II data, concluding that incidental exposure to Internet information is positively associated with Internet use, active health information seeking, and the use of health information gleaned from the traditional media. Exposure also was found to be positively associated with health knowledge. In short, greater use of the Internet and the traditional media (greater media exposure) translates to more knowledge about health issues. Likewise, Shapiro et al. (1997) and Shapiro (1999) found that exposure to advertisements influences cognitive processes that lead to buying behavior even without the explicit memory of exposure. These findings provide evidence that exposure to information affects knowledge and subsequent behavior.

Holden & Vanhuele (1999) support this observation, finding that a single auditory exposure to a fictitious brand can create the impression (one day later) that the brand actually exists even if people do not remember being exposed to any kind of information about it. This suggests that failure to remember being exposed to information does not mean people will forget the message (Holden & Vanhuele, 1999). However, this effect was found only when attention was deliberate, suggesting that attention also is necessary for information gain. Similarly, researchers studying cancer news coverage (Stryker, Moriarty & Jensen (2008) and Jensen (2011) found attention to be a necessary precursor to information gain. Cancer news coverage was observed to be positively related to the practice of cancer preventive behaviors only among those who regularly paid attention to health news.

Tian & Robinson (2009) document that exposure increases health knowledge while Shim et al. (2006) note that exposure also influences behavior change. Scholars also have found that attention is a significant predictor of knowledge gain (Holden & Vanhuele, 1999; Stryker, Moriarty & Jensen, 2008; and Jensen, 2011). Stryker, Moriarty & Jensen (2008) add that those who paid attention to mediated information practiced preventive behaviors more frequently. Thus, this study examines the influence of both exposure and attention on cognitive processes as well as subsequent behavioral intentions.

### **Hypotheses and Research Questions**

Following the propositions of the protection motivation model, this study poses the following research questions and hypotheses:

RQ1: What channels do people refer to for obesity and related media content? To what extent are they exposed to and how much attention do they to this type of media content?

H1: Exposure to anti-obesity media content will affect one's intention to exercise and maintain a healthy diet.

H2: Attention paid to anti-obesity media content will affect one's intention to exercise and maintain a healthy diet.

H3: Higher exposure to media obesity content will lead to greater threat appraisal.

H4: Higher attention paid to media obesity content will lead to greater coping appraisal (to exercise or maintain a healthy diet).

H5: Individuals who perceive greater severity and vulnerability will show a greater intention to exercise and/or maintain a healthy diet.

H6: Individuals who perceive great self-efficacy and response efficacy (coping appraisal of exercising or maintaining a healthy diet) will show greater intention to exercise and/or maintain a healthy diet.

RQ2: Do the results vary among demographic groups?

## CHAPTER 3

### METHODS

The goal of this analytical exploratory study was to determine whether exposure and attention to obesity media content influence people's intentions to exercise and abide by a healthy diet. To gather data for this study, an online questionnaire was emailed to a nonrandom sample of Iowa residents 18 years or older. Most studies that examine media effects on knowledge, attitude and behavior related to health issues have been conducted in urban settings. Iowa was chosen as the study's locale to determine the impact of mediate anti-obesity content on audiences in a more rural or agricultural state.

In addition, 2011 data show that Iowa ranked 18<sup>th</sup> on the CDC's list of most obese states, with 29% of residents self-reporting their obesity (CDC, 2012). This number is up from 2010, when 28.4% of Iowans reported being obese (CDC, 2012). Also, a new study commissioned by the Robert Wood Johnson Foundation determined an estimated 54% of Iowa's population could be obese by 2030, if the rising trend in obesity rates continues (Finney, 2012). Doctors indicate obesity is a continuing problem within the state, despite efforts to combat the condition. Doctors agree that despite the emphasis on obesity, especially within the educational and medical spheres, nothing is having an impact (Finney, 2012). The present study looked to popular media to determine its influence on people's intentions to combat obesity themselves.

#### **The Sample**

To gather data for this study, a one-shot descriptive and analytical online survey was conducted. A nonrandom sample of over 16,000 adults who reside in Iowa and attend Iowa



State University was procured from the university's Registrar's Office. To supplement this and garner responses from non-student adults, the survey was also be posted on the author's Facebook, with express instructions that respondents be adults residing in Iowa. The study's population was inflated in recognition of the relatively weak response rates obtained from online surveys.

The questionnaire was pretested on a simple convenience sample of Iowa residents to (1) establish the reliability of the scales used, (2) solicit suggestions for questionnaire modifications, (3) ensure that the questions and the instructions are understood, and (4) determine the approximate length of time needed to complete the questionnaire.

The survey was conducted over a seven-week period, beginning January 8, 2013. Participants were told that the survey aimed to assess their mass media habits and how they use media channels as sources of exercise and healthy diet information. To encourage participation, the names of those who returned the completed questionnaire were entered into a drawing to win a gift card worth ten dollars. Twenty respondents were randomly selected to receive this incentive.

### **The Questionnaire**

The questionnaire was composed of four sections. The first section asked for the respondents' exposure and attention to mass media channels. It also aimed to determine what types of media programs people resort to for information about how to prevent obesity (specifically through a healthy diet and by exercising regularly). The second section of the questionnaire aimed to ascertain people's attitudes toward following a healthy diet and exercising regularly in terms of perceived severity, perceived vulnerability, response efficacy,

and self-efficacy. The third part asked people to describe the actions they intended to take to prevent obesity. The fourth section asked for demographic characteristics such as age, gender, income, and education.

### **Variables and their Measure**

**R1: What channels do people refer to for obesity and related media content? To what extent are they exposed to and how much attention do they to this type of media content?**

To measure exposure, respondents were asked to use a five-point Likert scale (1=hardly ever; 5=every day) to indicate how often they see obesity and related information in the traditional and online media. Attention was measured by asking the respondents to report the level of attention they pay to this type of media content using a five-point Likert scale in which 1= little attention to each channel and 5=full attention.

**H1: Exposure to media anti-obesity content affects one's intention to exercise or maintain a healthy diet.**

*Exposure to obesity content in the media.* Within the context of this study, media exposure pertains to any contact with anti-obesity media content. It does not mean one has to actively participate in consuming the content; it simply means having seen, heard, or noticed any kind of anti-obesity media content. Obesity content in the context of this study refers to information about tactics for combating, reducing, and preventing obesity through the encouragement of physical activity (synonymous with exercising) and healthy eating habits (synonymous with dieting) found in the mass media. It does not include reports about the growing problem of obesity in the country.

Questions assessing this variable followed the general format used in a previous questionnaire by Rodriguez & Lee (2010) but were modified to evaluate consumption of obesity media content. Exposure to the following media channels was measured: television, radio, print and online newspapers, print and online magazines and journals, and other online sources. For each channel, respondents were asked to indicate about how many hours per day they spend on the channel. It can be assumed that spending more time with mediated sources will also increase exposure to anti-obesity media content.

*Intention to exercise.* Intention to exercise refers to the degree to which people plan to do various physical activities specifically those known to combat, reduce, and prevent obesity. Intentions are often viewed as a predictor of behavior (Tulloch et al., 2009).

To assess an individual's *intention to exercise*, a scale made up of two items developed and validated by Courneya & McAuley (1993) was used. Respondents were asked to indicate the degree to which they agree with the following statements: (1) I intend to exercise regularly over the next month, and (2) I intend to exercise regularly over the next six months. Responses to the two Likert scale items ranged from 1 "completely disagree" to 7 "completely agree." These items have been found to have high internal consistency ( $\alpha=0.91$ ). The answers to these two items were averaged to measure intention to exercise.

*Intention to maintain a healthy diet.* Like intention to exercise, this variable refers to people's motivation or intention to practice healthy eating habits. Individuals' *intention to maintain a healthy diet* was measured by asking respondents to indicate their agreement with the following two statements: (1) I intend to maintain a healthy diet over the next month, and (2) I intend to maintain a healthy diet over the next six months. Responses to the two Likert

scale items ranged from 1 “completely disagree” to 7 “completely agree.” The answers to these two items were averaged to measure intention to eat a healthy diet.

To test H1, two separate simple regression tests were performed.

**H2: Attention to media anti-obesity content affects one’s intention to exercise or maintain a healthy diet.**

*Attention to obesity content in the media.* Attention in this study refers to the level of cognitive consideration respondents give to obesity-related media content gleaned from various media channels. That is, it refers to a person internalizing, considering, and thinking about the media content he or she watches, listens to, or comes into contact with. For each channel listed to measure exposure, respondents were asked to indicate about how much attention they pay to obesity content using Likert scale items with a response range from 1 to 5 where 1 meant “no attention at all” and 5 meant “pay very close attention.”

As in H1, this hypothesis was tested by conducting two separate simple regression tests.

**H3: Higher exposure to media obesity content will lead to greater threat appraisal.**

*Threat appraisal.* The constructs of perceived severity and perceived vulnerability together form a person’s total threat appraisal (Courneya & Hellsten, 2001). Perceived severity is defined as one’s perception of how serious the consequences of the health issue are. Perceived severity thus refers to the negative consequences an individual associates with an event or outcome. These consequences may relate to an anticipated event that may occur in the future, or to a current state such as a pre-existing health problem. Perceived severity was measured by using a scale developed by the National Cancer Institute that was modified to capture people’s perception of obesity as a health problem. This index asked respondents to

indicate their level of agreement with the following statements: (1) The thought of being obese scares me; (2) When I think about being obese, I feel nauseous; (3) If I become obese, my career would be endangered; (4) Being obese would endanger my personal relationships; (5) My feelings about myself would change if I become obese; (6) I am afraid to even think about obesity; (7) My financial security would be endangered if I become obese; and (8) The health problems I would experience from being obese would last a long time. The response items ranged from 1 to 5 where 1 meant “definitely do not agree” and 5 meant “definitely agree.” The National Cancer Institute reports a Cronbach's alpha of 0.78 for this scale; test-retest reliability across an interval of two weeks was 0.76. Perceived severity was computed by averaging the responses to the eight items that comprised the scale.

Perceived vulnerability refers to one's perception of the likelihood of contracting or developing the health condition (Courneya & Hellsten, 2001). The threat construct of perceived vulnerability will be measured with items taken from the scale developed by Plotnikoff & Higginbotham (1988 & 2002), which has been used in a number of PMT studies (e.g., Rhodes, Plotnikoff & Courneya, 2008; Tulloch et al., 2009). The responses for each item ranged from 1 (definitely do not agree) to 5 (definitely agree). The scale developers report a Cronbach's alpha for vulnerability at 0.85 (Rhodes, Plotnikoff & Courneya, 2008).

To measure vulnerability, questions were split to assess physical activity and maintaining a healthy diet separately, but these items matched in both categories. An item was added to address the weight dimension. The items were: If I do not get enough physical activity, (1) I will be at risk for serious health problems, (2) I will be at risk of becoming overweight or obese, (3) I will be at risk for heart disease, and (4) I will be at risk for diabetes. The responses

for each item range from 1 (definitely do not agree) to 5 (definitely agree). Perceived vulnerability was computed by averaging the responses to the four items that comprised the scale.

To measure threat appraisal, perceived severity and perceived vulnerability were added and then averaged.

In this case, the independent variable is *exposure to obesity media content*, and *threat appraisal* is the dependent variables. A simple regression test was performed to determine whether exposure to obesity content in the media is a determinant of one's threat appraisal.

**H4: Higher attention paid to media obesity content will lead to greater coping appraisal (of exercising or maintaining a healthy diet).**

*Coping appraisal.* Self-efficacy and response efficacy are the two constructs that make up one's coping appraisal (Courneya & Hellsten, 2001). Courneya & Hellsten (2001) define self-efficacy as people's beliefs in their ability to perform the recommended response action—in this case, physical activity and following a healthy diet. Response efficacy is the perceived effectiveness of the suggested action or behavior in treating or combating the health problem (Courneya & Hellsten, 2001). In this study, the suggested remedies or behaviors are physical activity and a healthy diet, and the health issue is obesity.

Self-efficacy was measured using six items from Plotnikoff & Higginbotham (2002) who found the index to be internally consistent ( $\alpha=0.91$ ). Similar to the measure of perceived vulnerability, the items were used to separately gauge this variable's influence on physical activity and healthy diet intentions. The items included: I can get adequate exercise even when (1) I have many demands at work or at home, (2) I feel depressed, (3) I exercise alone, (4) I get

bored with the activities, (5) I don't notice an improvement in my fitness, and (6) I feel tired. The responses for these items ranged from 1 to 5 where 1 meant "definitely disagree" and 5 meant "definitely agree." The answers to these items were averaged to arrive at a measure of self-efficacy. Parallel scales were used to measure one's self-efficacy in maintaining a healthy diet; however, items three and four were excluded from the diet section, as they refer specifically to physical activity.

Response efficacy was also measured using items from Plotnikoff & Higginbotham (2002), who found the index internally consistent ( $\alpha=0.80$ ). Four items were modified to specifically reference the benefits of exercise and healthy eating. Again, the same eight items were used twice, once for physical activity and once for maintaining a healthy diet. The eight items were: Physical activity will or could (or maintaining a healthy diet will) (1) keep me healthy, (2) reduce my chances of getting serious health problems, (3) reduce my chances of becoming overweight or obese, (4) help me either remain fit or get fit, (5) give me a heart attack, (6) cause muscle and bone injuries to my body, (7) improve my chances of living longer, and (8) improve my overall alertness and thinking. The responses for these items ranged from 1 to 5 where 1 meant "definitely disagree" and 5 meant "definitely agree." The answers to these items were averaged to arrive at a measure of response efficacy. Again, parallel scales were used to measure the response efficacy of maintaining a healthy diet.

To measure coping appraisal, self-efficacy and response efficacy were added and then averaged, once for the coping appraisal of exercising and once for the coping appraisal of maintaining a healthy diet.

Two simple regression tests were performed to determine whether attention to obesity content in the media is a determinant of one's coping appraisal for exercising or maintaining and healthy diet.

**H5: Individuals who perceive greater severity and vulnerability will show a greater intention to exercise and/or maintain a healthy diet.**

A simple regression test was performed to determine the influence of *threat appraisal* on the two dependent variables in this hypothesis: *intention to exercise* and *intention to maintain a healthy diet*.

**H6: Individuals who perceive greater self-efficacy and response efficacy (for exercising or maintaining a healthy diet) will show a greater intention to exercise and/or maintain a healthy diet.**

Two simple regression tests were performed to determine the influence of *coping appraisal* (for exercising and for maintaining a healthy diet) on the two dependent variables in this hypothesis: *intention to exercise* and *intention to maintain a healthy diet*.

**RQ2: Does intention to perform healthy behaviors vary among demographic groups?**

*Gender.* To determine if males and females differ in terms of intention to exercise and follow a healthy diet, two separate independent samples t-tests were conducted.

*Ethnicity.* To determine if respondents of varying ethnicities differ in terms of intention to exercise and follow a healthy diet, two separate one-way analysis of variance tests were conducted.



*Education.* To determine if respondents of varying educational backgrounds differ in terms of intention to exercise and follow a healthy diet, two separate one-way analysis of variance tests were performed.

*Income.* To determine if respondents of varying income levels differ in terms of intention to exercise and follow a healthy diet, two separate one-way analysis of variance tests were performed.

*Weight, height, and age.* To determine if intention to exercise and follow a healthy diet are influenced by weight, height, and age, two separate simple regression tests were performed for each of the three variables.

## CHAPTER 4

### RESULTS AND DISCUSSION

The main objective of this study was to ascertain the influence of non-stigmatizing, motivational obesity (formerly anti-obesity) media content on people's intentions to perform healthy behaviors, namely exercising regularly and eating correctly. To investigate this link, it employed the tenets of Rogers' (1983) protection motivation theory (PMT), which posits that people respond to persuasive media messages via two cognitive processes: threat appraisal and coping appraisal (Courneya & Hellsten, 2001; Milne, Orbell & Sheeran, 2002; Plotnikoff et al., 2009; Tulloch et al., 2009). Theoretically, PMT suggests that as a person's perceived threat and coping appraisals increase, their intention to adopt the response behavior is also enhanced. This study expands PMT's theoretical axioms by examining whether exposure and attention to mass media health content influence these two cognitive processes (threat appraisal and coping appraisal) and, consequently, audience members' desire to implement the two recommended practices.

The current study used a one-shot descriptive and analytical online survey to test the theory and determine the influence of media messages in helping people cope or deal with the health threats posed by obesity. Respondents were asked to report their current media consumption practices, their attitudes toward exercising and maintaining dieting, their exercising and health eating intentions, and demographic information. To gather data, the online questionnaire was sent to 16,000 Iowa State University students. It was also posted on the author's Facebook page to encourage the participation of non-student populations.

## Demographic Characteristics of the Sample

A total of 858 respondents returned their questionnaires. Of these, 136 did not complete the study, and were therefore excluded from the sample. Thus, 722 were included in the analysis. All respondents were adult (over age 18) Iowa residents. The majority (524 or 72.6%) were females, 195 (27%) were males, and three (0.4%) chose not to disclose their gender.

The respondents' ages ranged from 18 to 83, with the largest group composed of those between the ages of 18 and 24 (78.2%). Nine (1.2%) were above age 65. Those between age 18 and 64 made up 98.1% of the sample. Of the 858, five (0.7%) chose not to report their age.

The majority of the respondents were European American/Caucasian (89.6%). The rest were African American (1.2%), Asian American (2.6%), Hispanic/Latino/Latina American (2.6%), Native American (0.8%), and other (mixed or biracial) (2.5%). Four (0.6%) chose not to disclose their ethnic background.

Because the sample consisted mainly of university students, it was expected that a large majority (478 or 66.2%) reported high school as the highest completed formal education. Some (132 or 18.3%) have a bachelor's degree; 109 (15.1%) have post-graduate degrees. Only one (0.1%) reported not having finished high school, while two (0.3%) chose not to report their educational attainment.

The annual income of respondents ranged from less than \$25,000 to more than \$65,000. As expected, the predominantly college student sample (586 or 81.2%) reported earning less than \$25,000; 72 (10%) earned \$25,000-\$45,000 per year. Those earning \$46,000-

\$65,000 and those with annual incomes more than \$65,000 constituted 3.5% and 3% of the sample, respectively. Of the 722, 17 (2.4%) did not disclose their earnings.

Another individual-level characteristic measured was Body Mass Index (BMI), which was computed by dividing body weight by the square of the height and then multiplying the product by 703. Of the 722 participants, 712 reported body weight and height, exhibiting a BMI minimum of 16.60 and a maximum of 50.11. Of these, eight outliers (BMIs above 2,000 or below 14) were excluded. Thus, 704 BMIs were categorized as underweight, normal, or obese. On average, respondents had BMIs of 24.9953, considered normal although only .0047 away from being overweight (BMI = 25.0).

A small number of respondents (3.4%) reported BMIs less than normal, putting them in the underweight category. The majority of the sample (58.5%) fell into the normal weight range (BMIs between 18.5 and 24.99). Some (38.1%) had BMIs over 25, considered overweight or obese (21.9% were overweight; 16.2% were obese). The CDC (2012) reports that 65.4% of Iowa adults are overweight or obese, with 28.4% being obese. Thus, the sample's BMIs cleaved more to the normal range compared to state statistics.

### **General Media Use Habits**

To determine their media exposure patterns, respondents were asked how many hours per day they spend viewing television, listening to the radio, reading newspapers, reading magazines or journals, or perusing the Internet. Table 1 shows the range and mean values for the use of each channel as well as the minimum, maximum, and mean value of total media exposure.

**Table 1. Media exposure (hours per day) by channel**

Channel	N	Minimum	Maximum	Mean
Television	679	0	12	1.9300
Radio	629	0	24	1.3523
Newspaper	603	0	20	0.7585
Magazine/Journal	556	0	3	0.3013
Online	716	0.50	24	4.5349
Total exposure	514	1.67	41	8.6173

As shown in Table 1, the respondents spent a large amount of time online and not a lot of time reading newspapers or magazines, a finding consistent with the media exposure characteristics of young people. They also spent fewer hours watching television and listening to the radio. Total exposure refers to the sum of responses regarding the use of five media channels listed in Table 1. For the 514 who answered all items, the minimum total exposure was 1.67 hours a day, while the maximum was 41, which indicates that many were using multiple media channels simultaneously. On average, the respondents were exposed to various media 8.62 hours per day.

### **Exposure and Attention to Obesity Media Content**

The first research question asks the extent to which respondents are exposed and attend to obesity media content. To answer this question, the channels they refer to for health information were ascertained. Table 2 outlines the respondents' preference for television, radio, print and online newspapers, print and online magazines and journals, and other online sources as sources of health information. It shows that the sample generally preferred to watch obesity-related TV news programs and talk shows. The "other" category of TV programs includes shows such as *The Biggest Loser*, shows about cooking, and the Food Network. Except for those considered reality TV shows, most are essentially talk shows. The majority also

listened to talk show radio programs and ads. Radio listeners who selected the “other” category said they listen to personal interviews with health professionals, music, National Public Radio, podcasts, and other radio stations.

A large majority of newspaper readers often referred to the Science or Health section and front-page or cover stories for health and related news. For online and print newspaper audiences, the “other” selections included the Arts as well as the Health and Fitness sections. Magazine and journal readers generally subscribed to publications that focus on health issues and nutrition-oriented magazines. The two respondents who selected “other” magazine-related reading fare mentioned a specific magazine, *Experience Life*, and the Internet as health information sources.

Notable in Table 2 is the large proportion of individuals (508 or 70.4%) who use Google to find health information online. Internet users said they generally go to government-sponsored webpages and news sites for health information. “Other” preferred online outlets included advertisements, blogs (e.g., those published by wellness coaches and personal trainers), health-oriented websites (e.g., crossfit.com, bodybuilding.com, spinalcolumnradio.com), ESPN, online publications, science websites, social media (e.g., Facebook, Twitter), weight loss forums, Wikipedia, other search engines, and YouTube.

**Table 2. Channels and programs used for obesity and related information**

Channel and program type	Frequency	Percent
<b>Television</b>		
News programs	203	28.1
Talk shows	202	28.0
Commercial advertisements	80	11.1
Paid programming	69	9.6
Other	58	8.0

<b>Radio</b>		
News programs	60	8.3
Talk shows	66	9.1
Commercial advertisements	84	11.6
Radio personalities	45	6.2
Other	23	3.2
<b>Newspapers (print and online)</b>		
Science or health section	256	35.5
Front page cover stories	105	14.5
Advertisements	45	6.2
Other	13	1.8
<b>Magazines and journals (print and online)</b>		
Men's or women's health magazines	149	20.6
Nutrition magazines	101	14.0
Academic journals	40	5.5
Other, non-health magazines	64	8.9
Other	2	0.2
<b>Other online sources</b>		
News sites	229	31.7
Government-sponsored sites	268	37.1
Television health sites	178	24.7
Google	508	70.4
Other	97	13.4

How often are they exposed to obesity and related media content? The respondents were asked to use a five-point Likert scale (1=hardly ever; 5=every day) to indicate how often they see non-stigmatizing, motivational obesity-related information in the media. Table 3 shows that on average, respondents were not exposed to this type of information very often. People reported seeing obesity media content mostly on television (average=1.299 hours a day). The least cited sources of this content were magazines and journals (average=1.154 hours a day). The overall average was 2.89, just over half the time dedicated to all mediated sources.

**Table 3. Average exposure (hours per day) to obesity media content, by channel**

Channel	N	Minimum	Maximum	Mean

Television	574	1	5	1.299
Radio	447	1	5	1.194
Newspaper	355	1	5	1.179
Magazine/Journal	197	1	5	1.154
Online	717	1	5	1.241
Average exposure	81	1.20	4.60	2.8889

How much attention do they pay to obesity and related media content? Respondents were asked to report the level of attention they pay to this type of media content using a five-point Likert scale in which 1= little attention to each channel and 5=full attention. Judging by the mean values shown in Table 4, for all channels except radio, they reportedly devoted “more than half” their attention to healthy dieting and exercising information, which was the same as the average attention spent on each media channel.

**Table 4. Attention paid to obesity and related media content, by channel**

Media channel	Total responses	Minimum (little attention)	Maximum (full attention)	Mean
Television	572	1	5	2.5600
Radio	444	1	5	2.0600
Newspaper	351	1	5	2.6000
Magazine/Journal	197	1	5	3.1900
Online	713	1	5	2.5300
Total attention	80	5	25	13.6625

#### **Attitudes Toward Exercising and Healthy Eating**

Attitudes toward exercising and healthy eating were measured using preexisting PMT indices. Respondents were asked to report their degree of agreement with a series of statements that aim to gauge their attitude about obesity. The eight-item index measuring perceived severity included: (1) The thought of being obese scares me; (2) When I think about being obese, I feel nauseous; (3) If I become obese, my career would be endangered; (4) Being obese would endanger my personal relationships; (5) My feelings about myself would change if



I became obese; (6) I am afraid to even think about obesity; (7) My financial security would be endangered if I become obese; and (8) The health problems I would experience from being obese would last a long time. Perceived vulnerability was measured using an eight-item index that asked respondents their perceive risks if they do not get enough physical activity and maintain a healthy diet. For each of these recommendations, they were asked to indicate the extent to which they agree that: (1) I will be at risk for serious health problems, (2) I will be at risk of becoming overweight or obese, (3) I will be at risk for heart disease, and (4) I will be at risk for diabetes.

The ten-item index measuring self-efficacy included: I can get adequate exercise even when (1) I have many demands at work or at home, (2) I feel depressed, (3) I exercise alone, (4) I get bored with the activities, (5) I don't notice any improvement in my fitness, and (6) I feel tired. Questions were asked a second time in reference to maintaining a healthy diet, though numbers three and four were excluded.

The 14-item index measuring response efficacy included: Physical activity will or could (1) keep me healthy, (2) reduce my chances of getting serious health problems, (3) reduce my chances of becoming overweight or obese, (4) help me either remain fit or get fit, (5) give me a heart attack, (6) cause muscle and bone injuries, (7) improve my chances of living longer, and (8) improve my overall alertness and thinking. Again, questions were asked a second time for maintaining a healthy diet, though items five and six were excluded.

The responses to these items were averaged to measure perceived severity, perceived vulnerability, self-efficacy, and response efficacy. Finally, the sum of answers to items measuring perceived severity and perceived vulnerability were averaged to determine threat

appraisal; the answers to self-efficacy and response efficacy items were averaged to measure coping appraisal. Table 5 outlines the minimum, maximum, and mean values for the six PMT variables.

**Table 5. Minimum, maximum, and mean values for the six PMT constructs**

<b>Construct</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>
Perceived severity	659	1.00	5	3.6259
Perceived vulnerability	694	1.00	5	4.1209
Self-efficacy	663	1.00	5	3.3388
Response efficacy	664	1.14	5	4.2212
Threat appraisal	636	1.06	5	3.8741
Coping appraisal	616	1.86	5	3.7827

Overall, the respondents considered obesity to be a severe condition ( $M=3.6259$ ) to which they perceived themselves to be highly vulnerable ( $M=4.1209$ ). They generally thought they were capable of performing actions to combat obesity ( $M=3.3388$ ), although this assessment registered the least of all the PMT constructs. Response efficacy, or the degree to which the recommended behaviors (exercising and healthy eating) were seen as feasible solutions to the obesity problem, was high ( $M=4.2212$ ). Taken together, the respondents saw obesity as a serious threat ( $M=3.8741$ ), but they considered the coping mechanisms available to them (exercising and healthy eating) to be effective in offsetting or alleviating the threat ( $M=3.7827$ ). However, in the case of the current sample, their appraisal of the threat was greater than their appraisal of the efficacy of coping strategies.

### **Behavioral Intentions**

Respondents were asked about two behavioral intentions: their intention to exercise and their intention to maintain a healthy diet on the short- and longer-term. Using a seven-point Likert scale, respondents were asked to report their plan to exercise and eat healthy

regularly over the next month and over the next six months. Responses to these questions were averaged to determine intention to exercise and intention to maintain a healthy diet. The mean values for these two variables were close, suggesting more than middle-level intention to exercise ( $M = 5.54$ ) and maintain a healthy diet ( $M = 5.61$ ).

### **Relationship Between Exposure and Behavioral Intentions**

H1 posits that exposure to obesity media content affects one's intention to exercise or maintain a healthy diet. To determine exposure to media content, respondents were asked how many hours per day they spend on the five channels (television, radio, print and online newspapers, print and online magazines and journals, and other online sources). This follows the general exposure items used by Rodriguez & Lee (2010), although modified for media health information consumption. Because of the ubiquity of obesity content in the general media agenda, H1 was tested using total exposure to media. Also, 514 of the 722 respondents gave general media exposure responses, while only 81 answered the questionnaire items that specifically asked for exposure to obesity media content.

A two-item scale developed and validated by Courneya & McAuley (1993) was used to assess intention to exercise and maintain a healthy diet. Using Likert scales with response options ranging from 1 (completely disagree) to 7 (completely agree), respondents indicated to what degree they agreed with the following statements: (1) I intend to exercise (or diet) regularly over the next month, and (2) I intend to exercise (or diet) regularly over the next six months. The intention to exercise index was found to be reliable ( $\alpha=0.921$ ); so was the intention to diet index ( $\alpha=0.931$ ).

A Pearson correlation test was performed to determine if there is a relationship between exposure to media and intention to exercise. The results show that the two variables did not correlate ( $r=0.002$ ,  $p=0.971$ ). Was exposure related to intention to maintain a healthy diet? A separate correlation test was performed. Again, the correlation between the two variables was found to be weak and non-significant ( $r=0.048$ ,  $p=0.276$ ). Thus, H1 was not supported.

### **Relationship Between Attention and Behavioral Intentions**

H2 posits that attention to media affects one's intention to exercise or maintain a healthy diet. Using five-point Likert scales where 1 meant "no attention at all" and 5 meant "pay very close attention," respondents indicated the degree to which they paid attention to each of the six media channels (television, radio, print and online newspapers, print and online magazines and journals, and other online sources). The attention index showed high reliability ( $\alpha=0.815$ ).

Correlation test results show that attention to media correlated weakly, but significantly, with intention to exercise ( $r=0.271$ ,  $p=0.015$ ). However, its relationship to intention to maintain a healthy diet was very weak and non-significant ( $r=0.032$ ,  $p=0.779$ ). A simple regression test was conducted to determine whether attention to media influenced intention to exercise. The results, shown in Table 6, show that attention was a significant determinant of intention to exercise [ $F(1, 78)=6.173$ ;  $p=.015$ ], contributing 7.3% of the variance. Thus, H2 was only partially supported. That is, attention had a significant effect on intention to exercise but not on intention to maintain a healthy diet.

**Table 6. Simple regression testing the influence of attention to non-stigmatizing, motivational obesity media content on intention to exercise**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.271 <sup>a</sup>	.073	.061	1.33035

a. Predictors: (Constant), Total attention

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	10.925	1	10.925	6.173	.015 <sup>a</sup>
	Residual	138.047	78	1.770		
	Total	148.972	79			

a. Predictors: (Constant), Total attention

b. Dependent variable: Intention to exercise

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.510	.513		8.784	.000
	Total attention	.089	.036	.271	2.484	.015

a. Dependent variable: Intention to exercise

**Relationship Between Exposure and Threat Appraisal**

H3 tests whether greater exposure to media obesity content leads to greater threat appraisal. Threat appraisal is a construct with two dimensions: perceived severity and perceived vulnerability (Courneya & Hellsten, 2001). A scale developed by the National Cancer Institute was modified to assess people's perceptions of obesity as a health problem (perceived severity). Using a series of five-point Likert scales where 1 meant "definitely do not agree" and 5 meant "definitely agree," respondents indicated their extent of agreement with the following statements: (1) The thought of being obese scares me; (2) When I think about being obese, I

feel nauseous; (3) If I become obese, my career would be endangered; (4) Being obese would endanger my personal relationships; (5) My feelings about myself would change if I become obese; (6) I am afraid to even think about obesity; (7) My financial security would be endangered if I become obese; and (8) The health problems I would experience from being obese would last a long time. The eight items proved to be internally consistent ( $\alpha=0.814$ ). Responses to the eight items were averaged as a measure of perceived severity.

Perceived vulnerability was measured using items taken from a scale developed by Plotnikoff & Higginbotham (1988 & 2002), which has been used in other PMT studies (e.g., Rhodes, Plotnikoff & Courneya, 2008; Tulloch et al., 2009). An item was added to the original index to specifically address weight. The following items were used for physical activity (exercising): If I do not get enough physical activity, (1) I will be at risk for serious health problems, (2) I will be at risk of becoming overweight or obese, (3) I will be at risk for heart disease, and (4) I will be at risk for diabetes. Parallel scales were used for maintaining a healthy diet. Taken together, the eight items measuring perceived vulnerability proved internally consistent ( $\alpha=0.914$ ). The responses to the eight items were averaged to measure perceived vulnerability.

Perceived severity and perceived vulnerability were then added and averaged to determine threat appraisal.

To test H3, a bivariate Pearson correlation test was performed. The results show that exposure and threat appraisal did not significantly correlate ( $r=0.060$ ,  $p=.201$ ). Thus, H3 was not supported.

### Relationship Between Attention and Coping Appraisal

H4 poses that more attention paid to media obesity content leads to greater coping appraisal (for exercising and for healthy eating). Six items from the Plotnikoff & Higginbotham (2002) index were used to determine self-efficacy. These items were: I can get adequate exercise even when (1) I have many demands at work or at home, (2) I feel depressed, (3) I exercise alone, (4) I get bored with the activities, (5) I don't notice any improvement in my fitness, and (6) I feel tired. Parallel scales were used for maintaining a healthy diet, though numbers three and four were excluded. The responses to these ten items were averaged to measure self-efficacy. This coping appraisal index was found to be reliable ( $\alpha=0.858$ ).

Eight items were taken from the Plotnikoff & Higginbotham (2002) index to measure response efficacy. Four were modified to specifically address the benefits of physical activity and healthy eating. These items were: Physical activity will or could (1) keep me healthy, (2) reduce my chances of getting serious health problems, (3) reduce my chances of becoming overweight or obese, (4) help me either remain fit or get fit, (5) give me a heart attack, (6) cause muscle and bone injuries, (7) improve my chances of living longer, and (8) improve my overall alertness and thinking. Parallel items were used for maintaining a healthy diet, except items five and six. Answers to these were averaged to measure response efficacy. The 14-item index was found to be reliable ( $\alpha=0.863$ ).

Self-efficacy and response efficacy were then added and averaged to determine coping appraisal for exercising and coping appraisal for maintaining a healthy diet.

The Pearson correlation results indicate a weak but significant relationship between attention and coping appraisal for exercising ( $r=0.246$ ,  $p=.041$ ) and coping appraisal for

maintaining a healthy diet ( $r=.269$ ,  $p=.022$ ). Thus, two simple regression tests were conducted.

The results, shown in Table 7 and Table 8, indicate that attention to media leads to greater coping appraisal for exercise [ $F(1, 67)=4.327$ ,  $p=.041$ ] and maintaining a healthy diet [ $F(1, 71)=5.519$ ,  $p=.022$ ].

Thus, H4 was supported. That is, those who paid more attention to the media were more likely to perceive the recommended behaviors as viable responses to combat obesity. The more people pay attention to the media, the more they felt competent to perform the two recommended actions.

**Table 7. Simple regression testing the influence of attention on coping appraisal (exercise)**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.246 <sup>a</sup>	.061	.047	.59672

a. Predictors: (Constant), Total attention

**ANOVA<sup>b</sup>**

Model		Sum of Squares	Df	Mean square	F	Sig.
1	Regression	1.541	1	1.541	4.327	.041 <sup>a</sup>
	Residual	23.857	67	.356		
	Total	25.398	68			

a. Predictors: (Constant), Total attention

b. Dependent variable: Coping appraisal (exercise)

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.610	.245		14.765	.000
	Total attention	.036	.015	.246	2.080	.041

a. Dependent variable: Coping appraisal (exercise)



**Table 8. Simple regression testing the influence of attention on coping appraisal (diet)****Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.269 <sup>a</sup>	.072	.059	.42773

a. Predictors: (Constant), Total attention

**ANOVA<sup>b</sup>**

Model		Sum of Squares	Df	Mean square	F	Sig.
1	Regression	1.010	1	1.010	5.519	.022 <sup>a</sup>
	Residual	12.990	71	.183		
	Total	14.000	72			

a. Predictors: (Constant), Total attention

b. Dependent variable: Coping appraisal (diet)

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.932	.167		23.492	.000
	Total attention	.028	.012	.269	2.349	.022

a. Dependent variable: Coping appraisal (diet)

**Relationship Between Threat Appraisal and Behavioral Intentions**

H5 proposes that individuals who perceive greater problem severity and vulnerability to obesity (combined to form one's threat appraisal) will show greater intention to exercise and/or maintain a healthy diet. To test this hypothesis, two separate simple regression tests were conducted. The findings show that threat appraisal (perceived severity and perceived vulnerability) is a significant predictor of intention to exercise [F (1, 630)=37.519; p=.000] as shown in Table 9 and intention to maintain a healthy diet [F (1, 628)=41.360; p=.000] as indicated in Table 10.

Thus, H5 was supported. Those who perceived obesity to be a threatening condition and who also saw themselves to be vulnerable to it showed greater intention to perform the two recommended healthy practices.

**Table 9. Simple regression testing the influence of threat appraisal on intention to exercise**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.237 <sup>a</sup>	.056	.055	1.46312

a. Predictors: (Constant), Threat appraisal

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	80.317	1	80.317	37.519	.000 <sup>a</sup>
	Residual	1348.657	630	2.141		
	Total	1428.974	631			

a. Predictors: (Constant), Threat appraisal

b. Dependent variable: Intention to exercise

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.421	.353		9.693	.000
	Threat appraisal	.551	.090	.237	6.125	.000

a. Dependent variable: Intention to exercise

**Table 10. Simple regression testing the influence of threat appraisal on intention to maintain a healthy diet**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.249 <sup>a</sup>	.062	.060	1.23280

a. Predictors: (Constant), Threat appraisal

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	62.858	1	62.858	41.360	.000 <sup>a</sup>
	Residual	954.428	628	1.520		
	Total	1017.286	629			

a. Predictors: (Constant), Threat appraisal

b. Dependent variable: Intention to diet

#### Coefficients<sup>a</sup>

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.696	.299		12.346	.000
	Threat appraisal	.490	.076	.249	6.431	.000

a. Dependent variable: Intention to diet

### Relationship Between Coping Appraisal and Behavioral Intentions

H6 posits that those who perceive greater self-efficacy and response efficacy (which, in combination, measures coping appraisal) will show greater intention to exercise and/or maintain a healthy diet. Pearson correlations show that the relationship between coping appraisal for exercising and intention to exercise to be strong and significant ( $r=.568$ ,  $p=.000$ ) while that between coping appraisal for maintaining a healthy diet and intention to diet is weak but significant ( $r=.295$ ,  $p=.000$ ). Thus, two separate simple regression tests were performed to test this hypothesis. The findings indicate that coping appraisal for exercising was a significant determinant of intention to exercise [ $F(1, 639)=304.314$ ;  $p=.000$ ] as shown in Table 11. Coping appraisal for maintaining a healthy diet also was a significant predictor of intention to maintain a healthy diet [ $F(1, 658)=62.534$ ;  $p=.000$ ] as shown in Table 12. Coping appraisal accounted for 32.3% and 8.5% of variance in intention to exercise and intention to maintain a healthy diet, respectively.

H6 was thus supported. This suggests that perceiving exercising and eating healthy as effective solutions to obesity as well as seeing oneself as capable of performing these two practices strengthened people's intention to abide by the two recommendations.

**Table 11. Simple regression testing the influence of coping appraisal on intention to exercise**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.568 <sup>a</sup>	.323	.322	1.23016

a. Predictors: (Constant), Coping appraisal

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	460.514	1	460.514	304.314	.000 <sup>a</sup>
	Residual	966.987	639	1.513		
	Total	1427.501	640			

a. Predictors: (Constant), Coping appraisal

b. Dependent variable: Intention to exercise

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.670	.394		-1.864	.063
	Coping appraisal	1.540	.088	.568	17.445	.000

a. Dependent variable: Intention to exercise

**Table 12. Simple regression testing the influence of coping appraisal on intention to maintain a healthy diet**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.295 <sup>a</sup>	.087	.085	1.21290

a. Predictors: (Constant), Coping appraisal

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	91.997	1	91.997	62.534	.000 <sup>a</sup>
	Residual	968.008	658	1.471		
	Total	1060.004	659			

a. Predictors: (Constant), Coping appraisal

b. Dependent variable: Intention to maintain a healthy diet

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.991	.460		4.331	.000
	Coping appraisal	.844	.107	.295	7.908	.000

a. Dependent variable: Intention to maintain a healthy diet

**Relationship Between Cognitive Appraisals and Behavioral Intentions**

Previous regression tests show that as separate variables, threat appraisal and coping appraisal were significant predictors of intention to exercise and intention to diet, but do the two appraisals work together to influence behavioral intentions? Additional analysis was done to answer this question. Two multiple regression tests were performed to determine the effect of threat appraisal and coping appraisal (exercise) on intention to exercise and the influence of threat appraisal and coping appraisal (diet) on intention to maintain a healthy diet.

The results show that only coping appraisal (exercise) was a significant predictor of intention to exercise [ $F(2, 572)=138.84, p=.000$ ], as shown in Table 13. However, both variables were found to be significant predictors of intention to maintain a healthy diet [ $F(2, 587)=33.09, p=.000$ ] as shown in Table 14. The results suggest that people associate the coping mechanism of maintaining a healthy diet more highly (compared to that of exercising) with combatting

obesity. The absence of the influence of threat appraisal on intention to exercise may suggest that people associate exercising with health threats besides obesity; thus, they still intend to exercise despite low perceived obesity threat.

**Table 13. Multiple regression testing the influence of threat and coping (exercise) appraisals on intention to exercise**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.572 <sup>a</sup>	.327	.324	1.23284

a. Predictors: (Constant), Coping appraisal (exercise), Threat

**ANOVA<sup>b</sup>**

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	422.037	2	211.018	138.838	.000 <sup>a</sup>
	Residual	869.376	572	1.520		
	Total	1291.413	574			

a. Predictors: (Constant), Coping appraisal (exercise), Threat

b. Dependent variable: Intention to exercise

**Coefficients<sup>a</sup>**

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.836	.422		-1.980	.048
	Threat	.046	.085	.020	.540	.589
	Coping (exercise)	1.536	.101	.564	15.277	.000

a. Dependent variable: Intention to exercise

**Table 14. Multiple regression testing the influence of threat and coping (diet) appraisals on intention to maintain a healthy diet**

**Model Summary**

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.318 <sup>a</sup>	.101	.098	1.21378

a. Predictors: (Constant), Coping appraisal (diet), Threat

#### ANOVA<sup>b</sup>

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	97.289	2	48.645	33.018	.000 <sup>a</sup>
	Residual	864.811	587	1.473		
	Total	962.100	589			

a. Predictors: (Constant), Coping appraisal (diet), Threat

b. Dependent variable: Intention to exercise

#### Coefficients<sup>a</sup>

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.698	.497		3.419	.001
	Threat	.287	.086	.146	3.323	.001
	Coping (diet)	.650	.127	.224	5.120	.000

a. Dependent variable: Intention to exercise

#### Influence of Demographic Variables

The second research question asks: Does intention to perform healthy behaviors vary according to demographic characteristics?

*Gender.* Two separate independent samples t-tests were conducted to determine if males and females differ in their intention to exercise and follow a healthy diet. The results (Table 15) show that gender did not play a significant role in influencing people's intention to exercise ( $t=.431$ ;  $df=712$ ;  $p=.667$ ). Intention to maintain a healthy diet also did not differ by gender ( $t=1.557$ ;  $df=711$ ;  $p=.120$ ).

**Table 15. T-tests showing no difference in intention to exercise and intention to maintain a healthy diet between gender**

	T	df	Sig.	Mean	Standard error	Interval of the

				difference	difference	difference	
						Lower limit	Upper limit
Intention to exercise	.431	712	.667	.05432	.12607	-.19319	.30183
Intention to diet	1.557	711	.120	.16539	.10623	-.04316	.37394

*Ethnicity.* Two separate one-way analysis of variance (ANOVA) tests were conducted to determine if intention to exercise and intention to maintain a healthy diet differed by ethnicity. The results (Table 16) show that race had no significant influence on intention to exercise or intention to maintain a healthy diet. However, the sample was largely made up of Caucasians; a more ethnically diverse sample may have yielded different results.

**Table 16. ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to ethnicity**

		Sum of squares	df	Mean square	F	Sig.
Intention to diet	Between groups	8.585	6	1.431	.905	.490
	Within groups	1117.469	707	1.581		
	Total	1126.054	713			
Intention to exercise	Between groups	21.581	6	3.597	1.619	.139
	Within groups	1572.782	708	2.221		
	Total	1594.362	714			

*Education.* Two separate one-way ANOVAs were conducted to determine if intention to exercise and intention to maintain a healthy diet differ by educational attainment. The results (Table 17) indicate that intention to exercise and intention to maintain a healthy diet did not



vary by education. However, the sample was largely made up of college students; a more diverse sample in terms of educational status may have produced different results.

**Table 17. ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to educational level**

		Sum of squares	Df	Mean square	F	Sig.
Intention to exercise	Between groups	10.400	3	3.467	1.556	.199
	Within groups	1583.962	711	2.228		
	Total	1594.362	714			
Intention to diet	Between groups	5.761	3	1.920	1.217	.303
	Within groups	1120.293	710	1.578		
	Total	1126.054	713			

*Income.* Two separate one-way ANOVAs were performed to determine if intention to exercise or maintain a healthy diet differ by income levels. The results (Table 18) show that the desire to perform the recommended practices did not vary by income. Again, the sample was comprised primarily of college-age students; a sample with a wider income range may have yielded different results.

**Table 18. ANOVA tests showing no difference in intention to exercise and intention to maintain a healthy diet according to income**

		Sum of squares	df	Mean square	F	Sig.
Intention to exercise	Between groups	6.162	4	1.540	.689	.600
	Within groups	1588.200	710	2.237		
	Total	1594.362	714			

Intention to diet	Between groups	8.568	4	2.142	1.359	.247
	Within groups	1117.486	709	1.576		
	Total	1126.054	713			

*Weight, height, and age.* A series of simple regression tests were performed to determine the impact of two physical characteristics (weight and height) and the demographic variable age on intention to exercise and maintain a healthy diet. The findings show that a person's weight significantly influenced intention to exercise [F (1, 709)=14.054; p=.000] and intention to maintain a healthy diet [F (1, 708)=14.029; p=.000] as shown in Table 19.

**Table 19. Simple regression tests showing the influence of weight on intention to exercise and intention to maintain a healthy diet**

#### Model Summary

Model	R	R square	Adjusted R square	Std. error of the estimate
1 <sup>b</sup>	.139 <sup>a</sup>	.019	.018	1.47799
2 <sup>c</sup>	.139 <sup>a</sup>	.019	.018	1.24490

- a. Predictors: (Constant), weight in pounds
- b. Intention to exercise
- c. Intention to diet

Model		Sum of squares	df	Mean square	F	Sig.
1 <sup>b</sup>	Regression	30.701	1	30.701	14.054	.000 <sup>a</sup>
	Residual	1548.777	709	2.184		
	Total	1579.477	710			
2 <sup>c</sup>	Regression	21.742	1	21.742	14.029	.000 <sup>a</sup>

	Residual	1097.244	708	1.550		
	Total	1118.986	709			

- a. Predictors: (Constant), weight  
b. Dependent variable: Intention to exercise  
c. Dependent variable: Intention to diet

### Coefficients

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. error	Beta		
1 <sup>a</sup>	(Constant)	6.397	.233		27.494	.000
	Weight	-.005	.001	-.139	-3.749	.000
2 <sup>b</sup>	(Constant)	6.337	.199		31.859	.000
	Weight	-.005	.001	-.139	-3.746	.000

- a. Dependent variable: Intention to exercise  
b. Dependent variable: Intention to diet

Height, on the other hand, did not significantly correlate with intention to exercise ( $r=.015$ ;  $p=.694$ ) or intention to maintain a healthy diet ( $r=.012$ ;  $p=.746$ ).

Likewise, age showed no significant relationship with intent to exercise ( $r=.062$ ;  $p=.100$ ) and desire to maintain a healthy diet ( $r=.025$ ;  $p=.497$ ).

### Discussion

The findings suggest that exposure alone does not have a bearing on intention to practice the recommended behaviors. Instead, people must pay attention to obesity and related information in order for it to influence behavioral intentions. In this case, however, attention to mediated health information influenced only people's intention to exercise.

The findings were similar when it came to threat appraisal, suggesting that mere exposure to information does not significantly affect audience members' cognitive processes.

Rather, attention—being involved with and understanding the information—was the significant predictor. That is, paying attention to messages increased people’s perceptions of the effectiveness of recommended behaviors as well as people’s assessments of their own abilities to perform those behaviors.

The results also show that coping appraisal significantly influenced intention to exercise and intention to maintain a healthy diet more strongly than did appraisals of threat. The findings imply that while perceived severity and perceived vulnerability (threat appraisal) did affect behavioral intentions, self-efficacy and response efficacy (coping appraisal) were stronger predictors of behavioral intent (especially to exercise). These findings were in line with those of another survey conducted by Tulloch et al. (2009), who found both coping and threat appraisals as predictors of behavioral intentions. They differ, though, in that the current study found coping appraisal to have a stronger influence, with coping appraisal for exercise having the strongest effect on intention to exercise. Plotnikoff et al. (2009), on the other hand, found that only coping appraisal influenced intentions.

The results suggest the power of PMT constructs (threat and coping appraisals) to predict behavioral intentions in tandem with attention to media obesity and related content. The paths toward stronger threat and coping appraisals, however, remain unclear in the absence of media exposure effect and the weak although significant influence of attention to mediated obesity content. Future studies must examine other potential media-related and other antecedents.

All demographic variables—age, gender, education, income, ethnicity—were found to have no significant effect on intention to exercise and/or maintain a healthy diet. The physical

characteristic height also had nothing to do with behavioral intentions. Weight, on the other hand, negatively predicted behavioral intentions. That is, as a people put on more weight, intention to exercise and intention to maintain a healthy diet decreased. This implies that if a person is already overweight or obese, their intention to exercise or diet is likely to be less than those with BMIs considered normal. Thus, it seems that combatting obesity might be a more difficult task than preventing its occurrence.

## CHAPTER 5

### CONCLUSIONS

The goal of the present study was to determine the influence of non-stigmatizing, motivational obesity media content on people's intentions to perform the actions recommended to combat the nation's growing obesity epidemic: exercising regularly and maintaining a healthy diet. Rogers' (1983) protection motivation theory (PMT) was used as a lens with which to examine this issue. PMT holds that people respond to persuasive messages via two cognitive processes: threat appraisal and coping appraisal (Courneya & Hellsten, 2001; Milne, Orbell & Sheeran, 2002; Plotnikoff et al., 2009; Tulloch et al., 2009). These processes then influence a person's intention and motivation to perform recommended behaviors. Specifically, PMT suggests that as a person's threat and coping appraisals increase, their intention to perform recommended response behavior(s) also intensify. Furthering the theory, this study examines whether exposure and attention to mass media obesity and related content had an impact on threat and coping appraisals and on subsequent intentions to implement the suggested healthy practices.

To gather data for the study, an online survey was conducted. Respondents were asked to report their media consumption habits, their attitudes toward exercising and maintaining a healthy diet, their exercising and healthy eating intentions, and demographic information. The online questionnaire was sent to 16,000 Iowa State University students and was posted on the author's Facebook page to solicit the participation of non-students.

The findings indicate that exposure alone does not significantly influence people's intention to exercise and maintain a healthy diet. Rather, attention proved to be a significant

predictor of behavioral intent, albeit only for intention to exercise and not for intention to maintain a healthy diet. Thus, exposure alone does not influence behavior, and attention to the media influences one's intention to exercise. In other words, when people come in contact with mediated health information, they must pay attention to it for it to have any effect on their subsequent behavioral intent.

PMT submits that protection motivation stems from two cognitive processes—threat appraisal and coping appraisal (Courneya & Hellsten, 2001). When people appraise threat, they assess the severity of the situation and examine how serious the situation is. Thus, its dimensions include perceived severity of a threatening event and the perceived probability that the threatening event will occur (vulnerability). Coping appraisal, on the other hand, refers to how one responds to the threatening situation. It consists of response efficacy (or the individual's expectation that carrying out recommendations can remove the threat) and self-efficacy (or the belief in one's ability to execute the recommended courses of action successfully).

The results of the present study suggest that exposure to mediated health information does not increase a person's appraisal that obesity poses considerable threat (perceived severity and perceived vulnerability). Instead, attention to media content positively correlated with people's coping appraisals for exercising and maintaining a healthy diet as prescriptions—their perception of the effectiveness of these recommended behaviors as well as their assessment of their own abilities to perform these behaviors. Although significant, the correlations were weak. The non-significant correlation between media exposure and threat appraisal may indicate fatigue with a long-running and continuous string of messages about the

disadvantages of obesity and the benefits of exercising and healthy eating. These messages are woven into a host of media fare—from hard news to entertainment—so much so that constant exposure may have already produced some kind of a ceiling effect.

When considered alone, both threat appraisal and coping appraisal were found to significantly affect intention to exercise and intention to maintain a healthy diet. When taken together, threat appraisal and coping appraisal were found to be significant predictors of intention to diet, but only coping appraisal was found to be a significant predictor of intention to exercise. In all instances, however, coping appraisal was found to be more strongly correlated with behavioral intentions, indicating that self-efficacy and response efficacy are stronger predictors of behavioral intent than perceived severity and perceived vulnerability. Specifically, coping appraisals alone strongly predicted one's intention to exercise and weakly (though still more strongly than threat) correlated with one's intention to maintain a healthy diet. This implies that while threat appraisal does significantly influence one's behavioral intent, coping appraisal plays a larger role in one's intention to exercise and maintain a healthy diet.

The results show support for the ability of the two major PMT constructs (threat and coping appraisals) to predict behavioral intentions in conjunction with attention paid to media content. However, factors leading to stronger threat and coping appraisals remain unclear, as mass media exposure did not show any influence on intention to perform the suggested courses of action, and attention to mediated health information had a significant but weak impact only on intention to exercise.

The study also found no significant effect of demographic characteristics (age, gender, education, income, and ethnicity) on behavioral intentions. Likewise, a person's height was



found to have no bearing on intention to exercise and maintain a healthy diet. A person's weight, however, did have a significant *negative* effect on people's intention to exercise and to maintain a healthy diet. That is, as weight increases, the likelihood of exercising and eating healthy decreases. This finding suggests that combatting obesity is a more difficult task for those already overweight or obese, compared to those with normal BMIs who are trying to stay away from the condition. It appears that there is some kind of a weight threshold after crossing which people no longer find it viable to either exercise regularly or to eat a balanced diet.

### **Comparison with Other Studies**

The current results are in agreement with those of Milne (2000) who also found coping appraisal to be a stronger predictor of behavioral intentions than threat appraisal (Purdie & McCrindle, 2002). In contrast, the survey results of Tulloch et al. (2009) suggest that threat and coping appraisals work together to influence behavioral intention. Other experimental studies also find that threat and coping appraisals influence action intentions (e.g., Beck, 1984; Courneya & Hellsten, 2001; McGowan & Prapavessis, 2010; Plotnikoff, Rhodes & Trinh, 2009), although the interactions among the four PMT variables differed.

Other scholars also have observed strong behavioral intention effects resulting only from self-efficacy. The survey data of Plotnikoff et al. (2009), for example, found no significant influence of threat appraisals. Similarly, Baranowski et al. (2003), conducting an experiment, found self-efficacy to be the main predictor of practice, but in combination with response efficacy. In both Plotnikoff et al. (2009) and Baranowski et al. (2003), however, threat appraisal was not found to be a significant predictor, unlike in the current study.

Other researchers also have detected no significant effect of demographic variables (e.g., Plotnikoff, Rhodes & Trinh, 2009; Plotnikoff et al., 2009) on behavioral intent. Purdie & McCrindle (2002) somewhat differed in that they found that women tended to perceive themselves as less able or less likely to perform the recommended healthy behaviors (self-efficacy) than men.

### **Implications of the Findings to Theory and Professional Practice**

The present study extends the tenets of PMT by adding exposure and attention to the mass media—through which people receive information regarding obesity and the ways to prevent this condition—into the analytical framework. About these additional antecedent variables the results show that attention paid to mediated health information is a significant predictor of coping appraisal as well as behavioral intent. This means that the amount of attention people pay to obesity-related media content enables them to assess their personal ability to perform the recommended practices and thus cope better with the perceived threat. Attention devoted to the mass media as a source of health information also was found to lead to greater motivations to follow the recommended practices to offset obesity. In other words, mere exposure to information is not enough. Audience members must be actively involved for subsequent behavioral decision making.

The findings of the current study also buttress those of previous investigations that both threat and coping appraisals are significant predictors of behavioral intent, offering more empirical evidence for the robustness of protection motivation theory. However, the results of the present study differ somewhat in that it found coping appraisal as a stronger predictor (compared to threat appraisal) of intentions to exercise and maintain a healthy diet. For health

communicators, this suggests that even if perceptions of threat are high, people can still be convinced to abide by the suggested courses of action by heightening their sense that these actions are viable and within their capabilities and means. When people perceive the recommended response to be effective and do-able, they are more likely to perform the recommended actions despite perceived threats.

The finding that media exposure did not correlate with intention to exercise or intention to maintain a healthy diet suggests that simply disseminating exercise and healthy eating information using mediated channels is not enough to help curb obesity. Rather, these mediated health messages must be presented in ways that grab and hold audience attention. This finding suggests greater competency among health communication practitioners in presenting non-stigmatizing, motivational obesity information. Campaign message presentation should have “hooks” that can hold audiences’ attention long enough to be able to deliver the message. Messages that heighten self-efficacy and response efficacy should be made more salient or the first things people remember upon exposure to obesity and related messages.

What are the best channels for non-stigmatizing, motivational obesity information? The majority of the respondents reportedly peruses online sources and watches television most frequently for health information. These findings point to the best channels to exploit in order to reach the highest number of people with persuasive reasons to exercise and eat a balanced diet.

Because both threat and coping appraisals significantly influence intention to exercise and to maintain a healthy diet, medical practitioners are well advised to offer their patients information that can aid in reasonably appraising the threat and in offering ways that will

strengthen coping abilities. Based on the findings, rather than stressing adverse consequences (severity) and risk factors (vulnerability), medical professionals should emphasize the benefits of performing healthy behaviors (response efficacy) as well as the patients' abilities to perform such actions (self-efficacy). Doing so will likely increase coping appraisal and subsequent behavioral intentions.

### **Limitations of the Study and Suggestions for Future Research**

Although the study can be considered a step forward in expanding the scope of variables that may have a bearing on protection motivation, it has three chief limitations. First, the sample primarily consisted of white, college-aged students with high school diplomas. Thus, the demographic characteristics of the respondents were largely the same. A probability sample would have been more representative of the population and therefore would have offered more generalizable results.

Second, the questionnaire was completed online, meaning that only those with computers, Internet access, and email addresses were able to participate. A mail survey would have reduced these sampling biases and enhanced generalizability.

Third, the questionnaire was sent only to those residing in Iowa, a primarily agricultural and rural state. While this provided insights about a relatively racially homogeneous group, it excluded those in highly populated, urban states. Results may differ with a more urban sample.

Although the present study found support to the PMT propositions that threat and coping appraisals are significant predictors of intention to exercise and intention to maintain a healthy diet, it fails to shed light on the factors leading to stronger threat and coping appraisals. The absence of media exposure effects on threat appraisal and intention to maintain a healthy

diet and exercise; the absence of attention effects on intention to maintain a healthy diet; and the significant but weak attention effect on coping appraisal and intention to exercise indicate that other mechanisms or factors are exerting influence on behavioral intentions. Thus, future studies should examine the paths that lead to stronger threat and coping appraisals.

Future studies employing the PMT also could examine actual behavior (as opposed to behavioral intentions) as the dependent variable. Studies have shown support for PMT's power to predict behavioral intent, but it is important if the findings of these studies hold for actual practice. Indeed some scholars have found evidence of short-term effects (Rhodes, Plotnikoff & Courneya, 2008). More research is necessary to validate the lack of long-term results.

The nature of media content varies; so do the modes of presentation and the quality of reporting, which were not taken into consideration in this investigation. It is important to ascertain the appraisal processes resulting from different types of information available through mass media channels. For instance, do these processes differ when people peruse blog postings as opposed to hard news emanating from traditional news organizations? Does this have a bearing on behavioral intent? Future studies should therefore validate the present study's results by focusing on content and examining the influence of different types of media messages.

## APPENDIX A

## IRB APPROVAL

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Institutional Review Board  
Office for Responsible Research  
Vice President for Research  
1138 Pearson Hall  
Ames, Iowa 50011-2207  
515 294-4566  
FAX 515 294-4267

**Date:** 12/4/2012

**To:** Raeann Ritland  
71792 130th St  
Zeairing, IA 50278

**CC:** Dr. Lulu Rodriguez  
214 Hamilton Hall  
Dr. Michael Dahlstrom  
215 Hamilton Hall

**From:** Office for Responsible Research

**Title:** Anti-obesity media content and its impact on people's intentions to eat health and exercise: A test of the Protection Motivation Theory

**IRB ID:** 12-569

**Study Review Date:** 12/3/2012

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

**Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form.** A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the

institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or [IRB@iastate.edu](mailto:IRB@iastate.edu).

**APPENDIX B****INFORMED CONSENT DOCUMENT****Obesity Media Content and Healthy Behavior Intentions**

Dear Respondent,

This study seeks to determine the degree to which information about obesity in the media influences individuals' intentions to engage in healthy behaviors like exercising and eating healthy. We seek your voluntary participation in this study. Would you please take approximately 10 minutes to complete the accompanying survey?

You must be 18 years or older to participate in this study.

**Description of procedures**

This survey entails completing a self-administered questionnaire that asks questions about your sources of information about obesity and how to prevent it, your attitudes toward exercising and dieting, your intentions to exercise and maintain a healthy diet, and general demographic information.

**Benefits**

If you decide to participate in this study, there may be no direct benefit to you. The findings are expected to inform and improve the ways by which information regarding how obesity can be controlled.

**Risks**

There are no foreseeable risks from participating in this study.

**Costs and compensation**



You will incur no cost from participating in this study. The emails of all who submit the questionnaire will be entered into a drawing for a gift card worth \$10. Twenty respondents will win this prize. If you are selected, you will be required to sign a Research Participant Receipt Form from Iowa State University.

### **Participants' rights**

Your participation in this study should be completely voluntary. You may refuse to participate by not submitting the questionnaire without any penalty or negative consequences. You may also skip questions to which you feel uncomfortable responding.

### **Confidentiality**

Your name, email, and responses will be kept confidential, and no comments will be attributed to you or any respondent in reports produced from data collected through this study.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: Once data are collected, the materials will be stored in a secure server. Your name and email will be erased when data collection is complete. If the results are published, your identity will remain confidential.

### **Contact Information**

If you need further information about this study, please contact:

1. Raeann Ritland, graduate student, Greenlee School of Journalism and Communication, Iowa State University; email: raeannr@iastate.edu, or
2. Dr. Lulu Rodriguez, research supervisor, Greenlee School of Journalism and Communication, Iowa State University; email lulurod@iastate.edu.

If you have any questions about the rights of research subjects or research-related injury, please contact:

1. Iowa State Institutional Review Board (IRB) Administrator, Tel: (515)-294-4566;  
email: IRB@iastate.edu, or the
2. Director, Office of Research Assurances, Tel: (515)-294-3115; address: 1138 Pearson Hall, Ames, IA 50010.

## APPENDIX C

## SURVEY QUESTIONNAIRE

## Obesity Media Content and Healthy Behavior Intentions

## I. CURRENT MEDIA PRACTICES

## Television

1. About how many hours a day do you spend watching television? *(If zero, skip to next section.)*

\_\_\_\_\_ hours a day

2. When watching television, how often do you see programs that offer diet or exercise information?

Hardly ever [ ] Once in awhile [ ] Somewhat often [ ] Often [ ] Every day [ ]

3. When watching television, how much attention do you pay to diet or exercise information?

No attention at all [ ] Very little attention [ ] Some attention [ ] Close attention [ ]

Very close attention [ ]

4. What types of TV programs do you turn to if you need information about how to maintain a healthy diet and/or exercise information? (Please circle all that apply.)

- a. News programs
- b. Talk shows
- c. Commercial advertisements
- d. Paid programming
- e. Other (please specify) \_\_\_\_\_
- f. Not applicable

## Radio

1. About how many hours a day do you spend listening to the radio? (*If zero, skip to next section.*) \_\_\_\_\_ hours a day

2. When listening to the radio, how often do you hear programs that offer diet or exercise information?

Hardly ever [ ] Once in awhile [ ] Somewhat often [ ] Often [ ] Every day [ ]

3. When listening to the radio, how much attention do you pay to diet or exercise information?

No attention at all [ ] Very little attention [ ] Some attention [ ] Close attention [ ]

Very close attention [ ]

4. What types of radio programs do you turn to if you need information about how to maintain a healthy diet and/or exercise information? (Please circle all that apply.)

- a. News programs (Solely news)
- b. Talk shows (Dedicated to talk)
- c. Commercial advertisements
- d. Radio personalities (Speaking between songs)
- e. Other (please specify) \_\_\_\_\_
- f. Not applicable

### **Print and Online Newspapers**

1. About how many hours a day do you spend reading a newspaper? (*If zero, skip to next section.*) \_\_\_\_\_ hours a day

2. When reading a print or online newspaper, how often do you see diet or exercise information?

Hardly ever [ ] Once in awhile [ ] Somewhat often [ ] Often [ ] Every day [ ]

3. When reading a print or online newspaper, how much attention do you pay to diet or exercise information?

No attention at all [ ] Very little attention [ ] Some attention [ ] Close attention [ ]

Very close attention [ ]

4. What newspaper sections or what types of websites do you turn to if you need information about how to maintain a healthy diet and/or exercise information? (Please circle all that apply.)

a. Science or Health section of the newspaper

b. Front page cover stories

c. Advertisements

d. Other (please specify) \_\_\_\_\_

e. Not applicable

### Print and Online Magazines and Journals

1. About how many hours a day do you spend reading a magazine? (*If zero, skip to next section.*)

\_\_\_\_\_ hours a day

2. When reading a print or online magazine or journal, how often do you see diet or exercise information?

Hardly ever [ ] Once in awhile [ ] Somewhat often [ ] Often [ ] Every day [ ]

3. When reading a print or online magazine or journal, how much attention do you pay to diet or exercise information?

No attention at all [ ] Very little attention [ ] Some attention [ ] Close attention [ ]

Very close attention [ ]

4. What types of online magazines or journals do you turn to when you need information about how to maintain a healthy diet and/or exercise information? (Please circle all that apply.)

- a. Men's or women's health magazines
- b. Nutrition magazines
- c. Academic journals
- d. Other magazines, not focusing on health \_\_\_\_\_
- e. Not applicable

**Other Online Sources (excluding online newspapers and magazines)**

1. About how many hours a day do you spend online? *(If zero, skip to next section.)*

\_\_\_\_\_ hours a day

2. When using the Web, how often do you see diet or exercise information?

Hardly ever [ ] Once in awhile [ ] Somewhat often [ ] Often [ ] Every day [ ]

3. When online, how much attention do you pay to diet or exercise information?

No attention at all [ ] Very little attention [ ] Some attention [ ] Close attention [ ]

Very close attention [ ]

4. What types of websites do you turn to if you need information about how to maintain a healthy diet and/or exercise information? (Please circle all that apply.)

- a. News sites (CBS, NBC, etc. but **not newspapers or magazine**)
- b. Government-sponsored health sites (NIH, CDC, Medline, etc.)
- c. Television health sites (droz.com, Rachel Ray, The Doctors, etc.)
- d. Google (using search terms)

e. Other (please specify) \_\_\_\_\_

f. Not applicable

## II. CURRENT ATTITUDES TOWARD EXERCISING AND EATING A HEALTHY DIET

On a scale of 1 to 5 with 1 being definitely not agree and 5 being definitely agree, to what extent do you agree with the following statements?

### 1. Perceived severity

	Definitely not agree			Definitely agree	
	1	2	3	4	5
The thought of being obese scares me.	1	2	3	4	5
When I think about being obese, I feel nauseous.	1	2	3	4	5
If I become obese, my career would be endangered.	1	2	3	4	5
Being obese would endanger my personal relationships.	1	2	3	4	5
My feelings about myself would change if I become obese.	1	2	3	4	5
I am afraid to even think about obesity.	1	2	3	4	5

My financial security would be endangered if I become obese. 1 2 3 4 5

The health problems I would experience from being obese would last a long time. 1 2 3 4 5

## 2. Perceived vulnerability

*If I don't get enough physical activity,*

	Definitely not agree	1	2	3	4	5	Definitely agree
I will be at risk for serious health problems.		1	2	3	4	5	
I will be at risk of becoming overweight or obese.		1	2	3	4	5	
I will be at risk for heart disease.		1	2	3	4	5	
I will be at risk for diabetes.		1	2	3	4	5	

*If I don't maintain a healthy diet,*

	Definitely not agree	1	2	3	4	5	Definitely agree
I will be at risk for serious health problems.		1	2	3	4	5	
I will be at risk of becoming overweight or obese.		1	2	3	4	5	
I will be at risk for heart disease.		1	2	3	4	5	
I will be at risk for diabetes.		1	2	3	4	5	



### 3. Self-efficacy

*I can get adequate exercise even when*

	Definitely not agree			Definitely agree	
I have many demands at work or at home.	1	2	3	4	5
I feel depressed.	1	2	3	4	5
I exercise alone.	1	2	3	4	5
I get bored.	1	2	3	4	5
I don't notice an improvement in my physical condition.	1	2	3	4	5
I feel tired.	1	2	3	4	5

*I can maintain a healthy diet even when*

	Definitely not agree			Definitely agree	
I have many demands at work or at home.	1	2	3	4	5
I feel depressed.	1	2	3	4	5
I don't notice an improvement in my physical condition.	1	2	3	4	5
I feel tired.	1	2	3	4	5

### 4. Response efficacy

*Physical activity will or could*

	Definitely not agree	Definitely agree
--	-------------------------	---------------------

Keep me healthy.	1	2	3	4	5
Reduce my chances of getting serious health problems.	1	2	3	4	5
Reduce my chances of becoming overweight or obese.	1	2	3	4	5
Help me to remain fit or to get fit.	1	2	3	4	5
Give me a heart attack.	1	2	3	4	5
Cause me muscle and bone injuries.	1	2	3	4	5
Improve my chances of living longer.	1	2	3	4	5
Improve my overall alertness and thinking.	1	2	3	4	5

*Maintaining a healthy diet will*

	Definitely not agree			Definitely agree	
Keep me healthy.	1	2	3	4	5
Reduce my chances of getting serious health problems.	1	2	3	4	5
Reduce my chances of becoming overweight or obese.	1	2	3	4	5
Help me to remain fit or to get fit.	1	2	3	4	5
Improve my chances of living longer.	1	2	3	4	5
Improve my overall alertness and thinking.	1	2	3	4	5

### III. CURRENT PHYSICAL ACTIVITY AND DIET INTENTIONS

#### Exercise and Diet Intention

On a scale of 1 to 7, with 1 being completely disagree and 7 being completely agree, where do you position yourself on the following statements?

I intend to exercise regularly over the next month.

1      2      3      4      5      6      7

I intend to exercise regularly over the next six months.

1      2      3      4      5      6      7

I intend to maintain a "healthy" diet over the next month.

1      2      3      4      5      6      7

I intend to maintain a "healthy" diet over the next six months.

1      2      3      4      5      6      7

### Exercise Behavior

Please indicate the number of *times per week* you participate in

Strenuous Exercise (e.g., running, jogging, hockey, football, soccer, basketball, biking) \_\_\_\_\_

Moderate Exercise (e.g., fast walking, baseball, tennis, easy biking, volleyball, dancing) \_\_\_\_\_

Mild Exercise (e.g., yoga, archery, fishing, bowling, golfing, easy walking) \_\_\_\_\_

### IV. DEMOGRAPHICS

What is your gender?

1. Female
2. Male
3. Other

Which of these categories best represents your race/ethnic background?

1. African American

2. Asian American
3. European American/Caucasian
4. Native American
5. Hispanic/Latino/Latina American
6. Other (please specify) \_\_\_\_\_

What is the highest formal education you have completed?

1. Less than high school
2. High school
3. Bachelor's degree
4. Higher education

What was your estimated annual income for 2011, before taxes?

1. <\$25,000
2. \$25,000-\$45,000
3. \$46,000-\$65,000
4. >\$65,000
5. What is your current weight, in pounds? \_\_\_\_\_ pounds
6. What is your current height, in inches? \_\_\_\_\_ inches
7. What was your age on your last birthday? \_\_\_\_\_ years

## APPENDIX D

## Study Code Book: Obesity Media Content and Healthy Behavior Intentions

Qu. No.	Variable Name	Variable Label	Values	Missing Values
	ID			
1	TVhours	Hours spent watching tv per day	Enter hours per day	
2	TVwatch	How often do you watch diet/exercise info programs?	1=Hardly Ever 2=Once in awhile 3=Somewhat often 4=Often 5=Every day	9=don't know, didn't answer
3	TVattn	Attention paid to TV	1=None 2=Very little 3=Some attention 4=Close attention 5=Very close attention	9=Missing, don't know
4a	TVnews	TV health info came from news	1=Circled	

		programs	0=Not Circled	
4b	TVtalk	TV health info came from talk shows	1=Circled 0=Not Circled	
4c	TVads	TV health info came from advertisements	1=Circled 0=Not Circled	
4d	TVpaid	TV health info came from paid programming	1=Circled 0=Not Circled	
4e	TVother	TV health info came from other programs	1=Circled 0=Not Circled	
5	RadHours	Hours spent listening to radio per day	Enter hours per day	
6	Radwatch	How often do you listen to diet/exercise	1=Hardly Ever	9=don't know, didn't

		info programs?	2=Once in awhile 3=Somewhat often 4=Often 5=Every day	answer
7	RadAttn	Attention paid to radio	1=None 2=Very little 3=Some attention 4=Close attention 5=Very close attention	9=don't know, didn't answer
8a	RadNews	Radio health information from news programs	1=Circled 0=Not Circled	
8b	RadTalk	Radio health information from talk shows	1=Circled 0=Not Circled	
8c	RadAds	Radio health information from commercial advertisements	1=Circled	

			0=Not Circled	
8d	RadPers	Radio health information from radio personalities	1=Circled 0=Not Circled	
8e	RadOther	Radio health information from other sources	1=Circled 0=Not Circled	
9	Newdays	Days spent reading newspaper per week	Enter days per week	
10	Newsread	How often do you read diet/exercise information?	1=Hardly Ever 2=Once in awhile 3=Somewhat often 4=Often 5=Every day	9=don't know, didn't answer
11	Newsattn	Attention paid to newspapers	1=None 2=Very little	9=don't know, didn't



			3=Some attention 4=Close attention 5=Very close attention	answer
12a	NewSci	Newspaper health info from science or health section of the newspaper	1=Circled 0=Not Circled	
12b	NewFront	Newspaper health info from front page cover stories	1=Circled 0=Not Circled	
12c	NewAds	Newspaper health info from advertisements	1=Circled 0=Not Circled	
12d	NewOther	Newspaper health info from other sources	1=Circled 0=Not Circled	
13	Magdays	Days spent reading magazines per week	Enter days per week	

14	Magread	How often do you read about diet/exercise in magazines?	1=Hardly Ever 2=Once in awhile 3=Somewhat often 4=Often 5=Every day	9=don't know, didn't answer
15	Magattn	Attention paid to magazines	1=None 2=Very little 3=Some attention 4=Close attention 5=Very close attention	9=don't know, didn't answer
16a	Magwhere	Magazine health information from men's or women's health magazines	1=Circled 0=Not Circled	
16b	MagNut	Magazine health information from nutrition magazines	1=Circled 0=Not Circled	

16c	MagAca	Magazine health information from academic journals	1=Circled 0=Not Circled	
16d	MagOther	Magazine health information from other magazines not focusing on health	1=Circled 0=Not Circled	
17	Onlhours	Hours spent online per day	Enter hours per day	
18	Onlseek	How often do you read about diet/exercise online	1=Hardly Ever 2=Once in awhile 3=Somewhat often 4=Often 5=Every day	9=don't know, didn't answer
19	Onlattn	Attention paid to online sources	1=None 2=Very little 3=Some attention 4=Close attention	9=don't know, didn't answer

			5=Very close attention	
20a	OnlNews	Online health information from news sites	1=Circled 0=Not Circled	
20b	OnlGov	Online health information from government-sponsored health sites	1=Circled 0=Not Circled	
20c	OnlTV	Online health information from television health sites	1=Circled 0=Not Circled	
20d	OnlGoog	Online health information from Google (using search terms)	1=Circled 0=Not Circled	
20e	OnlOther	Online health information from other sources	1=Circled 0=Not Circled	
21	PSobSC	The thought of being obese scares me.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer

22	PSnauseo	When I think of being obese, I feel nauseous.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
23	PSCareer	If I became obese, my career would be endangered.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
24	PSRelate	Being obese would endanger my personal relationships	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
25	PSmyself	My feelings about myself would change if I became obese.	1=Definitely not	9=don't know, didn't

			2=no 3=maybe 4=yes 5=Definitely yes	answer
26	PSafraid	I am afraid to even think about obesity.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
27	PSfinanc	My financial security would be endangered if I became obese.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
28	PShealth	Health problems would be long-lasting	1=Definitely not 2=no	9=don't know, didn't answer

			3=maybe 4=yes 5=Definitely yes	
29	PVprobs	If no PA, I'm at risk for serious health problems	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
30	PVObese	If no PA, I'm at risk of becoming overweight/obese	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
31	PVheart	If no PA, I'm at risk for heart disease	1=Definitely not 2=no 3=maybe	9=don't know, didn't answer

			4=yes 5=Definitely yes	
32	PVdiabet	If no PA, I'm at risk for diabetes	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
33	PVfoodHP	If not the right food, at risk for serious health problems	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
34	PVfoodOB	If not the right food, at risk for overweight/obesity	1=Definitely not 2=no 3=maybe 4=yes	9=don't know, didn't answer



			5=Definitely yes	
35	PVfoodHD	If not the right food, at risk for Heart Disease	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
36	PVfoodDA	If not the right food, at risk for diabetes	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
37	SEwork	I can get adequate exercise even when I have demands at work/home.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer

38	SEdepres	I can get adequate exercise even when I feel depressed.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
39	SEalone	I can get adequate exercise even when I exercise alone.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
40	SEbored	I can get adequate exercise even when I get bored.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
41	SEnoFit	I can get adequate exercise even when I see no improvement	1=Definitely not	9=don't know, didn't

			2=no 3=maybe 4=yes 5=Definitely yes	answer
42	SEtired	I can get adequate exercise even when I feel tired.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
43	SEfoodWO	I can maintain a healthy diet, even when I have demands at work/home.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
44	SEfoodDE	I can maintain a healthy diet, even when I feel depressed.	1=Definitely not 2=no	9=don't know, didn't answer

			3=maybe 4=yes 5=Definitely yes	
45	SEfoodFI	I can maintain a healthy diet, even when I don't see an improvement in my fitness.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
46	SEfoodTI	I can maintain a healthy diet, even when I'm tired.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
47	REhealth	Physical activity will keep me healthy.	1=Definitely not 2=no 3=maybe	9=don't know, didn't answer

			4=yes 5=Definitely yes	
48	REprobs	Physical activity will reduce my risk for serious health problems.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
49	REobese	Physical activity will reduce my risk of becoming overweight/obese.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
50	REgetfit	Physical activity will help me get fit	1=Definitely not 2=no 3=maybe 4=yes	9=don't know, didn't answer

			5=Definitely yes	
51	REheart	Physical activity will give me a heart attack.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
52	REinjury	Physical activity will cause muscle and bone injuries to my body.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
53	RElonger	Physical activity will increase longevity	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer

54	REalert	Physical activity will improve alertness and thinking	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
55	REfoodHE	Maintaining a healthy diet will keep me healthy.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
56	REfoodHP	Maintaining a healthy diet will reduce my chances of serious health problems.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
57	REfoodOB	Maintaining a healthy diet will reduce my chances of becoming	1=Definitely not	9=don't know, didn't

		overweight/obese.	2=no 3=maybe 4=yes 5=Definitely yes	answer
58	REfoodFI	Maintaining a healthy diet will help me remain or get fit.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
59	REfoodHA	Maintaining a healthy diet will give me a heart attack.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
60	REfoodIN	Maintaining a healthy diet will cause injury to bones and muscle.	1=Definitely not 2=no	9=don't know, didn't answer



			3=maybe 4=yes 5=Definitely yes	
61	REfoodLL	Maintaining a healthy diet will help me living longer.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
62	REfoodAT	Maintaining a healthy diet will improve my alertness and thinking.	1=Definitely not 2=no 3=maybe 4=yes 5=Definitely yes	9=don't know, didn't answer
63	PAMonth	I intend to exercise regularly over the next month.	1=Completely disagree 2=Disagree 3=Somewhat disagree	9=don't know, didn't answer

			4=Neutral 5= Somewhat agree 6=Agree 7=Completely agree	
64	PAMonth6	I intend to exercise regularly over the next 6 months	1=Completely disagree 2=Disagree 3=Somewhat disagree 4=Neutral 5= Somewhat agree 6=Agree 7=Completely agree	9=don't know, didn't answer
65	FOMonth	I intend to maintain a "healthy" diet over the next month.	1=Completely disagree 2=Disagree 3=Somewhat disagree 4=Neutral 5= Somewhat agree	9=don't know, didn't answer

			6=Agree 7=Completely agree	
66	FOMonth6	I intend to maintain a "healthy" diet over the next 6 months	1=Completely disagree 2=Disagree 3=Somewhat disagree 4=Neutral 5= Somewhat agree 6=Agree 7=Completely agree	9=don't know, didn't answer
67	Stren	Strenuous Exercise per week	Enter times per week	
68	Moderate	Moderate Exercise per week	Enter times per week	
69	MildPA	Mild Exercise per week	Enter times per week	
70	Gender	Gender	1=Female 2=Male 3=Other	9=don't know, didn't answer
71	Ethnic	Ethnicity	1=African American	9=don't

			<p>2=Asian American</p> <p>3=European American</p> <p>4=Native American</p> <p>5=Hispanic/Latino/Latina American</p> <p>6=Other</p>	<p>know, didn't answer</p>
72	Edu	Highest formal education completed	<p>1=less than high school</p> <p>2=high school</p> <p>3=bachelor's degree</p> <p>4=higher education</p>	<p>9=don't know, didn't answer</p>
72	Income	Estimated income for 2011 before taxes	<p>1=&lt;\$25,000</p> <p>2=\$25,000-\$45,000</p> <p>3=\$46,000-\$65,000</p> <p>4=&gt;\$65,000</p>	<p>9=don't know, didn't answer</p>
73	Weight	Weight in pounds	Enter weight	<p>999=don't know, didn't answer</p>

74	Height	Height in inches	Enter height	99=don't know, didn't answer
75	Age	Current age	Enter age	99=don't know, didn't answer

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