

6-2017

# The Influence of Health Framing on Weight Stigma and Health Knowledge

Serena D. Stevens

Follow this and additional works at: <http://scholarsrepository.llu.edu/etd>

 Part of the [Clinical Psychology Commons](#)

---

## Recommended Citation

Stevens, Serena D., "The Influence of Health Framing on Weight Stigma and Health Knowledge" (2017). *Loma Linda University Electronic Theses, Dissertations & Projects*. 473.  
<http://scholarsrepository.llu.edu/etd/473>

This Dissertation is brought to you for free and open access by TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. It has been accepted for inclusion in Loma Linda University Electronic Theses, Dissertations & Projects by an authorized administrator of TheScholarsRepository@LLU: Digital Archive of Research, Scholarship & Creative Works. For more information, please contact [scholarsrepository@llu.edu](mailto:scholarsrepository@llu.edu).

LOMA LINDA UNIVERSITY  
School of Behavioral Health  
in conjunction with the  
Faculty of Graduate Studies

---

The Influence of Health Framing on Weight Stigma and Health Knowledge

by

Serena D. Stevens

---

A Dissertation submitted in partial satisfaction of  
the requirements for the degree  
Doctor of Philosophy in Clinical Psychology

---

June 2017

© 2017

Serena D. Stevens  
All Rights Reserved

Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

\_\_\_\_\_, Chairperson  
Sylvia Herbozo, Associate Professor of Psychology

\_\_\_\_\_  
Adam Aréchiga, Associate Professor of Psychology

\_\_\_\_\_  
Holly E. R. Morrell, Associate Professor of Psychology

\_\_\_\_\_  
Randy Stinnett, Assistant Clinical Professor, LLU School of Medicine

## ACKNOWLEDGEMENTS

Thank you to Dr. Sylvia Herbozo for supporting me in the development of my own research and for all of the projects you brought me in on to hone my skills. I appreciate all your hard work with feedback and edits and fighting with data collection problems, and your support throughout grad school was an important part of my journey. Thank you also to my friends and family for enduring my passionate diatribes on weight stigma and the difficulties with long-term weight loss and for being willing to ask questions and provide your own perspectives and frustrations.

# CONTENT

Approval Page.....	iii
Acknowledgements.....	iv
List of Tables .....	vii
List of Abbreviations .....	viii
Abstract.....	ix
Chapter	
1. Introduction.....	1
2. Literature Review.....	3
Obesity .....	3
Weight Stigmatization .....	4
Health Behavior Change .....	7
News Media and Obesity .....	10
Improving Knowledge and Locus of Control .....	12
Moderating Variables.....	14
Protestant Work Ethic.....	14
Race/Ethnicity.....	16
Weight.....	18
Aims .....	19
3. Method .....	21
Participants.....	21
Measures .....	24
Demographic Information.....	24
Race/Ethnicity.....	24
Body Mass Index (BMI).....	24
Protestant Work Ethic.....	25
Health Behavior Knowledge.....	25
Health Locus of Control.....	26
Weight Stigmatization .....	27
Experimental Conditions and Stimuli .....	27

Procedure.....	28
Data Analysis .....	29
4. Results.....	30
Hypothesis 1.....	30
Hypothesis 2.....	31
Hypothesis 3.....	32
5. Discussion.....	33
Health Knowledge .....	33
Anti-fat Attitudes .....	34
Health Locus of Control.....	36
Limitations and Strengths .....	37
Implications and Future Directions.....	39
Conclusions.....	39
References.....	41
Appendices	
A. Demographic Information .....	49
B. Protestant Work Ethic Scale .....	50
C. Health Behavior Knowledge: Dietary Recommendations .....	52
D. Health Behavior Knowledge: Diet-Disease Relationships .....	53
E. Exercise Knowledge .....	56
F. Multidimensional Health Locus of Control .....	57
G. Anti-fat Attitudes Test (AFAT).....	60
H. Health-focused Article.....	62
I. Weight-focused Article.....	65
J. Control Article.....	69
K. Debriefing Form.....	71

## TABLES

Tables	Page
1. Demographic Variables for Sample.....	23
2. Study Variables by Article Group.....	24
3. Variables Involved in Study Analyses.....	29

## ABBREVIATIONS

AFAT	Anti-fat Attitudes Test
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
PWE	Protestant Work Ethic
MHLLoC	Mental Health Locus of Control
NKQ	Nutrition Knowledge Questionnaire
SPSS	Statistical Package for the Social Sciences

## ABSTRACT OF THE DISSERTATION

The Influence of Health Framing on Weight Stigma and Health Knowledge

by

Serena D. Stevens

Doctor of Philosophy, Graduate Program in Clinical Psychology  
Loma Linda University, June 2017  
Dr. Sylvia Herbozo, Chairperson

With increasing rates of obesity and obesity-related health problems, recent years have seen a great deal of effort exerted to improve physical health by reducing obesity. While information about health is frequently communicated through news media, research has shown that news articles do not increase knowledge of physical health behaviors and instead increase weight stigma, which predicts decreased physical and mental health. Given that this method of presenting health information is ineffective and harmful, it is important to examine alternative ways to frame information on physical health behaviors. This study examined differential effects of three article types, Health Improvement, Weight Loss, or Control on health behavior knowledge, anti-fat attitudes, and health locus of control. Protestant work ethic, ethnicity, and BMI were also explored as moderators in the relationship between type of article and change in anti-fat attitudes. Participants were recruited from the subject pool at a university in Southern California and by posts on the social media site Reddit.com. The final sample size of 124 was 62.1% female, with ages ranging from 18 to 65 ( $M = 26.58$ ,  $SD = 9.82$ ) and a mean BMI of 25.38 ( $SD = 6.59$ ). The hypotheses were not supported, with no dependent variables changing significantly over time and type of article not showing a significant effect on change in the dependent variables, all  $p > .05$ . While the covariates did predict anti-fat

attitudes overall (all  $p < .01$ ), no interactions between the covariates and the main effects were significant. These results are not in line with previous research, which is likely due to factors such as small sample size, measurement differences, and study design limitations. To our knowledge, this is the first study to examine the effects of news articles on increasing health behavior knowledge and health locus of control in addition to decreasing weight stigma. Future studies would benefit from increased sample size. In addition, it would be helpful to alter published news articles to reduce the differences between articles and include specific information on health knowledge that was examined by the measures; this would prevent the inclusion of additional confounds.

## **CHAPTER ONE**

### **INTRODUCTION**

With increasing rates of obesity (World Health Organization, 2016) and a high percentage of the United States classified as overweight or obese (Centers for Disease Control and Prevention, 2015), combined with multiple obesity-related health problems (Kahn, Hull, & Utzschneider, 2006; National Heart, Lung, and Blood Institute, 2012; U.S. Department of Health and Human Services, 2001), recent years have seen a great deal of effort exerted to improve physical health by reducing obesity. While much of the scientific community focuses on policy changes such as education, taxes on foods viewed as unhealthy, and increasing the availability of healthy food options (Nestle & Jacobson, 2000; Sacks, Swinburn, & Lawrence, 2009), news media and public health campaigns invariably focus on the theme of personal responsibility.

Unfortunately, current news articles tend to have an unhelpful effect. Specifically, they do not improve readers' knowledge of physical health behaviors or beliefs that they can engage in these behaviors; they instead reinforce weight stigma by portraying individuals with obesity as gluttonous, lazy, or selfish (Saguy, Frederick, & Gruys, 2014; Saguy & Gruys, 2010). Weight stigma, in turn, has been found to predict a wide variety of unhealthy behaviors leading to decreased physical and mental health (Alegria, Drury, & Louis, 2002; Ashmore et al., 2008; Carels et al., 2009; Fettich & Chen, 2012; Friedman et al., 2008; Friedman et al., 2005; Puhl, Moss-Racusin, & Schwartz, 2007; Vartanian & Shaprow, 2008).

If news articles do not increase knowledge of or self-efficacy related to physical health behaviors, and instead increase weight stigma, then these ostensibly helpful

articles may have a paradoxical effect and result in poor health. It would be helpful to examine whether alternative ways of framing physical health information in news articles can reduce weight stigma, increase physical health knowledge, and promote an internal locus of control. An internal locus of control would increase confidence that engaging in health behaviors will lead to improved physical health (Wallston, Wallston, & DeVellis, 1978). It would also be helpful to explore the impact of moderating variables, such as ethnicity, the reader's BMI, and views on personal accountability (such as the Protestant work ethic ideology) on the relationship between reading physical health news articles and stigmatizing attitudes.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **Obesity**

According to the World Health Organization (2016), the rates of obesity worldwide have more than doubled since 1980. In 2014, it was estimated that the BMI of more than 1.9 billion adults aged 18 and older fell within or above the overweight interval. Of this number, 600 million were classified as obese. In the US, 36.5% of adults are classified as obese and another approximately 33% are classified as overweight; among children, 17% are classified as obese (Centers for Disease Control and Prevention, 2015). Nearly all minority ethnic groups have higher rates of obesity than Caucasians (Wang & Beydoun, 2007), although Asian Americans overall have obesity rates at about half of the national average. The highest levels of obesity are found in non-Hispanic black individuals who have an age-adjusted obesity rate of 48.1% (CDC, 2015). Black women have a rate as high as 20% above that of non-Hispanic Caucasian women (Wang & Beydoun, 2007). Clearly obesity is a problem affecting individuals of varying ages and ethnic groups.

The U.S. Department of Health and Human Services (2001) has reported that obesity predicts a 50 to 100% increased risk of premature death. Obesity predicts an increased risk of coronary heart disease and heart failure, a greater likelihood of being diagnosed with high blood pressure and having a stroke, and higher triglycerides and cholesterol (Kahn, Hull, & Utzschneider, 2006). Higher weight is also related to an increased risk of cancer, osteoarthritis, breathing problems, reproductive complications,

diabetes, and gallstones (Kahn, Hull, & Utzschneider, 2006; National Heart, Lung, and Blood Institute, 2012).

However, recent research by Flegal, Kit, Orpana, and Graubard (2013) has indicated that weight and health may not be so closely linked as previously reported. These researchers found that, while grades 2 and 3 obesity (i.e., BMIs above 34.9) do result in higher mortality rates, grade 1 obesity (BMI between 30.0 and 34.9) does not appear to affect mortality, and having a BMI in the overweight category (BMI between 25.0 and 29.9) may result in lower all-cause mortality. In addition, Nammi et al. (2004) reported that losing weight does not always result in improved health; these researchers also stated that physical health benefits may result from a change in behaviors even if weight loss does not occur or does not last. A study by Matheson, King, & Everett (2012) found that after controlling for health habits, weight status no longer predicted poor health. In contrast, a study by Yu et al. (2017) recently indicated that the finding that overweight is related to lower mortality may be confounded by individuals losing weight before death; this study found that examining weight history versus current weight may provide a more accurate picture of the relationship between weight and health. Regardless of whether obesity is a cause or a side effect of poor health, the increasing rates of obesity indicate a potential public health crisis.

### **Weight Stigmatization**

Individuals with higher BMIs are highly stigmatized. Goffman (1963) defined a stigmatized person as “possessing an attribute that makes [them] different from others . . . and of a less desirable kind” (p. 3). Individuals with higher BMIs encounter stigma and

discrimination from many sources, including from family members, peers, and strangers (Carr, Jaffe, & Friedman, 2008; Friedman, Ashmore, & Applegate, 2008; van den Berg, Neumark-Sztainer, Eisenberg, & Haines, 2008). This weight stigma includes experiences ranging from children ostracizing their overweight peers and attributing negative traits such as “cruel” to their classmates (Powlishta, Serbin, Doyle, & White, 1994), to rude comments and poor treatment by medical providers (Gudzune, Bennett, Cooper, & Bleich, 2014; Kaminsky & Gadaleta, 2002; Vartanian & Shaprow, 2008). Anti-fat attitudes, which lead to weight stigma, have been documented across ethnicities and weight categories (Greenleaf, Chambliss, Rhea, Martin, & Morrow Jr., 2006; Harris & Smith, 1982; Wang, Brownell, & Wadden, 2004). Considering the pervasiveness of these attitudes, it is likely that a person with a higher body weight experiences discrimination from multiple sources concurrently.

Experiencing weight stigma and discrimination is not only unpleasant in the short term, but it also has long-ranging effects on both mental and physical health. Experiencing discrimination has been shown to mediate the relationship between obesity and low self-acceptance (Carr & Friedman, 2005) and to predict poor body image by increasing negative attitudes about one’s own weight (Friedman et al., 2005). Hunger and Major (2014) also found that perceived weight discrimination mediates the relationship between BMI and psychological health (examined through self-esteem, depressive symptoms, and quality of life). Other research has found relationships between experiencing weight stigma and increased general psychological distress, higher depression, poorer body image, and lower self-esteem (Ashmore et al., 2008; Fettich & Chen, 2012; Friedman et al., 2008; Friedman et al., 2005).

In addition to psychological health, a meta-analysis by Phelan et al. (2015) suggested that medical professionals greatly stigmatize individuals with higher BMIs, which leads to poor treatment adherence, avoidance of care, and mistrust of doctors. Experiencing weight stigma from any source also predicts unhealthy behaviors, including binge eating or emotional eating (Ashmore et al., 2008; Puhl, Moss-Racusin, & Schwartz, 2007), higher healthcare utilization (Hilbert et al., 2014), and exercise avoidance (Vartanian & Shaprow, 2008). Finally, experiencing weight stigma predicts lower perceived health (Hilbert, Braehler, Haeuser, & Zenger, 2014; Hunger & Major, 2014), lower self-efficacy related to physical activity, and poor objective fitness, regardless of actual body size (Greenleaf, Petrie, & Martin, 2014)

There may also be a direct effect of discrimination on physical health outcomes. Research has shown that experiencing weight stigma predicts negative effects on health, similar to the effects of racial discrimination (Vartanian & Smyth, 2013). Indeed, Rosenthal et al. (2015), examined bullying based on race and weight and found similar negative effects on blood pressure and BMI among the two types of bullying. Tomiyama (2014) hypothesized that these effects may be due to increased cortisol levels associated with the stress of experiencing discrimination. Schvey, Puhl, and Brownell (2014) examined this hypothesis and found that cortisol levels increased in women of *all* weights after watching a video that stigmatized overweight or obese individuals, indicating that weight stigma may also have negative health effects on individuals who observe others being stigmatized, not only those who are the targets of weight stigma.

## **Health Behavior Change**

Given that obesity is associated with many health problems (Kahn, Hull, & Utzschneider, 2006), researchers have focused on developing interventions to reduce these problems. The most widely used obesity treatment is weight loss. Weight loss methods are highly variable and can include dietary changes, physical activity changes, behavioral therapy, pharmacology, and surgery (Nammi, Koka, Chinnala, & Boini, 2004). Dietary changes such as low calorie or very low calorie diets and meal replacements can result in weight loss, but weight loss maintenance is often very poor. In fact, one-third to two-thirds of individuals who lose weight using a restrictive diet method gain back more weight than they lose (Grodstein et al., 1996; Mann et al., 2007). Increasing physical activity does not improve weight loss significantly over dietary changes, although it does greatly improve many facets of physical health and psychological well-being (Penedo & Dahn, 2005).

Behavioral therapy is considered to be an effective adjunct to other weight loss methods. Behavioral therapy strategies for weight loss include goal-setting, self-monitoring, and stimulus control. Research has shown consistently that behavioral interventions for weight loss have significant short-term success. Wadden, Butryn, and Wilson (2007) reported that 80% of patients who begin behavioral treatments complete them, with an average of 8-10% of initial weight lost. However, weight loss resulting from behavioral methods levels off after six months, after which weight regain begins (Butryn, Webb, & Wadden, 2011), indicating that the difficulty with behavioral interventions lies in weight loss maintenance. However, even cognitive-behavioral interventions for weight loss with a focus on weight loss maintenance have been found to

be as ineffective in the long-term as traditional behavioral methods that focus solely on weight loss (Cooper et al., 2010).

For those with BMIs in the obese or morbidly obese categories, medications or surgery may be indicated to achieve significant weight loss (Nammi et al., 2004). Medications are generally considered to be a supplemental option and contribute to weight loss by reducing food intake, suppressing appetite, altering metabolism, and increasing energy expenditure (Bray, 2001). Unfortunately, the effects of medications are modest and patients show considerable weight regain when they are discontinued (Bray, 2001; Fisher & Schauer, 2002). Weight loss surgery, approved for those with a BMI above 40 or above 35 if they have medical comorbidities (i.e., the “morbidly obese”), has a higher long-term rate of success than dietary, behavioral, or pharmacological interventions (Fisher & Schauer, 2002; Mechanick et al., 2008). However, the surgery is only available for those with extremely high body weight, which limits the number of individuals eligible for this intervention, and there is a risk of surgical complications (Mechanick et al., 2008).

A common theme when exploring weight loss options is the difficulty with maintaining weight loss or preventing weight regain. One meta-analysis of weight loss interventions indicated that participants gained back approximately 80% of the weight lost at five-year follow-up (Anderson, Konz, Frederich, & Wood, 2001). A more recent review by Butryn et al. (2011) reported that participants gained back one-third of lost weight within a year and nearly one-half of participants were back to their original weight within five years.

Despite the great deal of research attention on examining factors involved in weight regain, it remains unclear why so many individuals struggle with weight maintenance. While some factors are certainly behavioral, including impulse control and a return to previous eating and activity patterns (Weygandt et al., 2015; Wing & Phelan, 2005), other biological factors may involve gene expression, number and size of adipose cells, signaling between adipose cells and brain processes, microbiome changes in the gut, or long-term hormonal adaptation (Giles et al., 2016; MacLean, Higgins, Giles, Sherk, & Jackman, 2015; Sumithran et al., 2011; Thaiss et al., 2016). Very likely it is a combination of these factors that is unique to the individual.

Given that even the most successful attempts at weight loss usually result in some amount of weight regain (Butryn et al., 2011), many individuals intending to lose weight engage in weight cycling, which involves losing and regaining weight repeatedly. Weight cycling often leads to poor health outcomes including hypertension, a higher risk for mortality from coronary heart disease, and greater all-cause mortality (Brownell & Rodin, 1994; Guagnano et al., 2000). Promoting health behavior change with the emphasis on weight loss, rather than an emphasis on improved overall health, as the end goal may actually result in poorer health outcomes.

Obesity prevention may be the best solution for the future, with some interventions showing success (Stice, Shaw, & Marti, 2006); however, with the high prevalence of obesity and the causes of weight regain still uncertain, it is important to identify ways to improve health that include alternatives to weight loss. Such alternatives may involve emphasizing health behaviors such as eating five or more fruits and vegetables per day, exercising regularly, consuming alcohol in moderation, and not

smoking (Matheson et al., 2012). These health behaviors are often associated with weight loss, but research has shown that health benefits such as lowered blood pressure and cholesterol can be achieved with health behavior change even in the absence of weight loss (Campos et al., 2006). In addition, while weight loss frequently predicts lowered risk for illness and death (CDC, 2015; Nammi et al., 2004), improved health is not a guaranteed result of losing weight. Finally, a recent study indicated that health behaviors may have a stronger impact than weight on mortality (Matheson et al., 2012). In fact, in the study by Matheson et al., those within the normal BMI range had the lowest risk of death *only* when an individual reported zero of the examined healthy habits (eating five or more fruits and vegetables per day, exercising in moderation, not smoking, and drinking alcohol in moderation). Improving adherence to health behavior recommendations is an important goal, aside from the connection between the health behaviors and weight.

### **News Media and Obesity**

Although emphasizing health behavior change may be more effective for improving physical health than current methods of encouraging weight loss, there is little accessible, non-weight-focused information on changing health behaviors. For example, the websites for both the Centers for Disease Control (2015) and the Mayo Clinic (2015) offer extensive resources for weight loss through health behavior change, but these websites do not examine the direct impact of physical health behaviors, such as changes in diet and exercise, on physical health outcomes. In addition, many individuals receive

health information from media reports and news articles, and these sources are not immune to the strong focus on weight loss (Saguy & Gruys, 2010).

In fact, while the goal of news and media articles focused on obesity may be to improve the health of those with higher weights, they likely have the opposite effect. Saguy et al. (2014) conducted a series of five experiments to explore the effects of four possible ways to frame obesity messages in the media: the public health crisis frame, the personal responsibility frame, the health at every size frame, and the fat rights frame. The public health crisis frame describes obesity as an epidemic and uses dramatic language to portray it as a frightening situation that must be addressed, while the personal responsibility frame portrays obesity as a personal moral failing and places the blame on the individual. These two are the most common frames used in news articles. Health at every size emphasizes that people of all sizes can be healthy and educates regarding the difficulty with long-term weight loss. Although this frame is becoming more common, it is still relatively rare and often met with backlash from those who believe it will reduce incentives or desire for the public to adopt health behaviors (Kirkland, 2008), despite the lack of evidence supporting such effects. The fat rights frame explores weight as a social justice issue and is the most controversial of the frames. This frame works to reduce weight-related stigma and focuses on civil rights (Saguy et al., 2014).

In their 2014 study, Saguy et al. found that reports framing obesity as a public health crisis and those emphasizing personal responsibility did not increase perception of obesity-related health risks. However, these types of reports did significantly increase dislike and negative stereotypes of individuals with higher weights. Other research has found that media messages about weight may negatively impact other health behaviors. A

study by Major, Hunger, Bunyan, and Miller (2014) indicated that when women who perceived themselves as overweight read an article with stigmatizing content, they later consumed more calories and perceived themselves as having less dietary control than women who did not read these articles. Articles with stigmatizing content are less likely to promote positive health behaviors and self-efficacy, and they also may predict increased weight stigma and poorer health behaviors.

### **Improving Knowledge and Locus of Control**

Only limited research has examined messages that may increase health behavior knowledge and therefore promote health behavior change. In the study by Saguy et al. (2014), news articles using the health at every size or fat rights frames tended to reduce prejudice and decrease support for policies to reduce obesity. However, they also did not affect awareness of obesity-related health risks, which could be due to the reduction in weight stigma (e.g., learning that individuals of all sizes can be healthy may decrease the perception that obesity is related to poor health outcomes). Given the research on the negative physical and psychological effects of weight stigma, reducing prejudice will likely lead to improved health. It is likely that a news article could make an even stronger impact if the article led to increased knowledge of health behaviors and a greater internal locus of control regarding physical health in addition to reducing weight stigma.

Health locus of control refers to the extent that individuals believe that their health is determined by their behavior (Wallston, Wallston, & DeVellis, 1978). Two main loci of control have been identified: internal and external. An internal health locus of control involves the perception that a person has power over his or her health, while an

external health locus of control views outside influences (such as chance or others) as having power over health. A review by Wallston and Wallston (1978) indicated that having an internal health locus of control may predict increased adherence to medical recommendations, keeping medical appointments, and increasing health behaviors. A news article that increased knowledge of health behaviors and internal health locus of control would likely be the most effective at promoting health behavior change.

Some research has examined the impact of health messages on intentions to engage in behaviors. A study by Puhl, Peterson, and Luedicke (2012) examined the impact of public health campaigns focused on improving health behaviors. Results found the most favorable responses (i.e., more positive ratings and higher intentions to comply with advice) to campaigns that focused on increasing fruit and vegetable consumption, improving multiple behaviors instead of focusing on one specific behavior, and instilling confidence. Participants responded most negatively to campaigns that implied personal responsibility and those perceived as stigmatizing. Other studies by Simpson, Griffin, and Mazzeo (2017) and Puhl, Luedicke, and Peterson (2013) found that weight-neutral public health campaigns may be more effective at increasing self-efficacy than obesity-focused or weight-focused campaigns. Although this study examined public health campaigns rather than news articles, the results indicate that it may be possible to present health information in a way that increases health efficacy and does not promote stigma.

To my knowledge, no research has examined the effects of a health behavior-focused article that did not emphasize weight loss as a goal. As discussed above, there is evidence indicating that weight-focused health framing falls short of its goal of increasing health behaviors and in fact has negative effects on the reader, such as increasing weight

stigma. Given such negative effects, research should examine alternate frames for presenting health behavior knowledge. If health information can be effectively conveyed without increasing weight stigma, it may be possible to incorporate these messages into media outlets to promote overall physical and mental health.

### **Moderating Variables**

It is likely that articles including health behavior information would impact stigmatizing beliefs differently based on a number of factors, including the Protestant work ethic ideology, race/ethnicity, and body mass index (BMI).

### ***Protestant Work Ethic***

Puhl and Brownell (2003) argued that an ideology characterized by the Protestant work ethic could lead to increased weight stigma. Specifically, this ideology represents a general tendency to make attributions of controllability, communicating that hard work is rewarded, and those who experience misfortune are to blame for their suffering due to lack of work or effort (Crandall, 1994). Protestant work ethic ideology also contains underlying ideas of self-denial, self-determinism, and productivity (Mirels & Garrett, 1971). In the context of weight stigma, the Protestant work ethic may imply that individuals who are overweight/obese lack self-control and that their weight status is due to their own personal or moral failings. Such views are in line with the personal responsibility frame for obesity (Saguy et al., 2014), which depicts higher weight as resulting from the person's actions and must be remedied via hard work. Higher weight is often associated with lower socioeconomic status, a demographic characteristic that is

also often stigmatized as a trait of poor character; this association underscores the notion of the Protestant work ethic as related to a personal responsibility frame (Crandall & Schiffhauer, 1998).

There is initial support for the connection between Protestant work ethic beliefs and weight stigma. Crandall (1994) found a correlation between the Protestant work ethic ideology and anti-fat attitudes, indicating that stronger perceptions of weight as controllable predicted more negative attitudes toward those with higher weights. In addition, Quinn and Crocker (1999) conducted two studies examining the effects of the Protestant work ethic ideology, participant BMI, and psychological well-being. Results from the first study indicated that women who identified more strongly with the Protestant work ethic ideology showed differing levels of body dislike and psychological well-being depending on their weight. Of particular note, women who held to higher levels of the Protestant work ethic ideology along with higher weight showed increased body dislike and lower psychological well-being. Those with low levels of adherence to the Protestant ethic ideology did not show differing levels of body dislike or psychological well-being among weight groups. Furthermore, a second study by Quinn and Crocker (1999) found that overweight participants primed with a political speech emphasizing a Protestant work ethic ideology reported lower well-being following the speech. In contrast, those who read a control speech that did not emphasize the Protestant work ethic ideology showed no change in well-being. Since higher adherence to the Protestant work ethic ideology predicts higher weight stigma, it is likely that a news article emphasizing weight loss and personal responsibility may contribute to stronger

weight stigma attitudes in those with higher levels of adherence to the Protestant work ethic compared to those with lower levels of adherence.

### *Race/Ethnicity*

To date, no research has examined the effect of race or ethnicity on how news articles influence one's weight stigma beliefs. However, there is research on the effect of race/ethnicity on weight stigma beliefs in general. Specifically, some studies have found no ethnic differences in weight stigma (Greenleaf et al., 2006; Wang, Brownell, & Wadden, 2004), while other studies have shown African Americans to be more accepting of higher body weights than Caucasian individuals (Latner, Stunkard, & Wilson, 2005). Saguy and Gruys (2010) suggested that African American girls may be "buffered from fashion pressures to be thin by a vibrant ethnic culture that values . . . 'thicker' body types" (p. 34). This is consistent with research showing that African American women have higher body satisfaction than Caucasian women (Grabe & Hyde, 2006; Hebl & Heatherton, 1998). However, no studies have demonstrated significant differences between other ethnicities in terms of weight stigma. Part of the reason for the lack of significance may be due to insufficient group representation in the study samples, as Caucasians generally outnumber minority groups significantly in terms of representation.

Research examining media representations of ethnic groups reveals contrasting findings. Gollust, Eboh, and Barry (2012) found that news magazines underrepresent African Americans and Latinos compared to Caucasians. This finding could suggest to readers that obesity is a "Caucasian" problem, which is objectively not the case given that obesity rates are approximately 10% higher in non-Asian minority ethnic groups than in

Caucasians (Wang & Beydoun, 2007). Viewing obesity as a problem that only applies to Caucasians has the potential to increase self-efficacy in Caucasian individuals and decrease it in African Americans and Latinos; however, it is important to note that Gollust and colleagues (2012) only used articles from *Time* and *Newsweek*, which they noted appeal to a predominantly wealthy, Caucasian demographic. This may partially explain the lack of diversity shown in the articles examined.

In a more expansive examination of news articles, Saguy and Gruys (2010) found that non-Caucasian ethnic groups were mentioned more often than Caucasians in media representations of obesity. In addition, Saguy and Almeling (2008) stated that the depiction of minority groups is often negative and focused on blaming individuals' choices for their body sizes. Such representations may lead Caucasians to associate obesity with stereotyped views of race and result in a more negative view of individuals with higher weights. Indeed, Gollust et al. (2012) reported that articles in which African Americans are portrayed in a stereotypical manner increase punitive attitudes toward African Americans among Caucasians. Taken altogether, it is possible that the media depictions of obesity and race have increased weight stigma among Caucasians by associating obesity with race and racism.

The literature in this area is lacking and it is important to tease apart the influence of ethnicity on individuals' reactions to depictions of weight and health. Given that weight stigma is likely more common in Caucasians than in ethnic minority groups and that the media has inaccurately represented the role of race in obesity, it is likely that ethnicity will play a role in individuals' reactions to the news article. An examination of

ethnicity in this context may provide insight into potential methods of targeting news media to most appropriately reach diverse audiences.

### *Weight*

Research on the effect of weight on an individual's views of weight stigma is inconclusive. Some research has indicated that lower participant BMI predicts higher weight stigma beliefs. Latner, Stunkard, and Wilson (2005) found that individuals of average weight have more stigmatizing attitudes toward those of higher weight. Similarly, Schwartz, Vartanian, Nosek, and Brownell (2006) found that those with a lower BMI had greater implicit and explicit stigma against obese persons, although stigmatizing attitudes were still prevalent in all groups. These results are in line with expectations that individuals within a stigmatized group would be protected against negative views of group members, similar to the effect of group membership on stigma among African Americans (Branscombe, Schmitt, & Harvey).

However, other studies have found the opposite effect. Rich et al. (2007) explored weight stigma attitudes in children and found that stigma increased as respondent BMI increased. Friedman et al. (2005) showed similar findings in adults. Other earlier studies (e.g., Harris and Smith, 1982), found no difference in stigma among weight groups. Some research has suggested that, while individuals with other minority statuses tend to have self-protective attitudes associated with group identification, individuals with high weight do not have these self-protective attitudes (Crandall, 1994; Quinn & Crocker, 1999). No articles were found that examined whether a person's weight influences his or her response to media depictions of obesity. Given the research findings above, it may be that

individuals with higher weights would respond just as strongly to messages of weight stigma as would those with average weights to articles depicting obesity as a personal responsibility.

### **Aims**

The primary goal of this study is to examine alternate ways of framing health behavior information aimed at improving health behavior knowledge and increasing health locus of control, while at the same time reducing weight stigma. An additional goal of this study is to explore moderators in the relationships between framing health information in news articles and anti-fat attitudes. Three articles were used as the stimuli: the Health Improvement article, the Weight Loss article, and the Control article. The Health Improvement article focused on the importance of diet and exercise behaviors to improve health, while the Weight Loss article focused on the importance of diet and exercise behaviors to lose weight. The Control article focused on climate change. The following are the hypotheses for the current study:

1. The type of article will predict changes in diet and exercise knowledge, such that participants reading either the Health Improvement article or the Weight Loss article will report increased diet and exercise knowledge from pre- to post-test, while those exposed to the Control article will show no change in diet and exercise knowledge.
2. The type of article will predict changes in anti-fat attitudes, such that participants reading the Health Improvement article or the Control article will show no difference in anti-fat attitudes from pre- to post-test, while those reading the Weight Loss article will show increased anti-fat attitudes from pre- to post-test. It is also predicted that

participant Protestant work ethic, race/ethnicity, and BMI will moderate this relationship. Specifically, it is predicted that individuals who show higher Protestant work ethic ideology, who identify as Caucasian, or who have higher BMI will show greater increases in anti-fat attitudes after reading the Weight Loss article than those with lower Protestant work ethic ideology, who identify as a race other than Caucasian, or who have lower BMI.

3. The type of article will predict changes in health locus of control, such that participants reading the Health Improvement article or the Weight Loss article will show an increase in health locus of control, while those reading the Control article will show no change in this variable.

## CHAPTER THREE

### METHOD

#### Participants

Participants were recruited from the subject pool at a university in Southern California ( $n = 23$ ) and by posts on the social media site Reddit.com ( $n = 206$ ). These posts asked for participation from those interested in sharing their opinion on a recent issue in the news, which is a recruitment strategy employed by Saguy et al. (2014). Seventy-eight participants were excluded from analyses because they had not completed any measures beyond demographic information. Twelve additional participants did not complete the post-test measure of anti-fat attitudes or health locus of control and were also excluded from analyses involving the use of these measures. One participant did not enter a value for weight, and BMI could not be calculated for this individual. Another individual entered their weight as ten pounds, which is not a valid weight value. Both individuals were excluded from analyses. An additional 13 participants were shown two of the three articles instead of one due to Qualtrics error. These participants were excluded from analyses.

The final sample size of 124 was 62.1% female, with ages ranging from 18 to 65 ( $M = 26.65$ ,  $SD = 9.82$ ) and a mean BMI of 25.38 ( $SD = 6.59$ ). See Tables 1 and 2 for additional demographic information. The study was approved by the university ethics committee for research.

**Table 1.** Demographic variables for sample

Variable	<i>N</i>	%	Variable	<i>N</i>	%
Gender			Race/Ethnicity		
Female	77	62.1	White (non-Hispanic)	88	71.0
Male	42	33.9	Hispanic	14	11.3
Transmale	4	3.2	Black (non-Hispanic)	1	0.8
Other	1	0.8	Asian	14	11.3
Education			Multiracial	6	4.8
Some High School	5	4.0	Native American/ First Nations	1	0.8
High School/ Equivalent	14	11.3	Sexual Orientation		
Some College/ Associate's	48	38.7	Straight	81	65.3
Bachelor's	36	29.0	Bisexual	27	21.8
Graduate Degree	21	16.9	Gay	6	4.8
BMI Category			Lesbian	4	3.2
Underweight	10	8.1	Asexual	4	3.2
Normal Weight	56	45.2	Other	2	1.6
Overweight	32	25.8			
Obese	26	21.0			

*Note.* BMI = Body Mass Index

**Table 2.** Study variables by article group.

	Health Improvement (n = 43)	Weight Loss (n = 34)	Control (n = 41)	<i>p</i>	Partial $\eta^2$
	<i>M (SD)</i>				
1. BMI	26.39 (7.34)	24.77(5.77)	24.98(6.51)	.525	.011
2. AFAT					
Pre-test	107.98 (27.48)	102.19(19.67)	107.43(26.55)	.533	.010
Post-test	103.78 (26.53)	98.06(22.49)	103.27(31.38)	.617	.009
3. Exercise					
Knowledge					
Pre-test	4.21(1.23)	4.11(1.15)	4.16(1.40)	.939	.001
Post-test	4.19(1.45)	3.97(1.69)	3.86(1.66)	.637	.007
4. PWE	130.26(18.42) <sup>a</sup>	119.76(15.45) <sup>a</sup>	126.73(11.92)	.011	.072
5. Nutrition					
Knowledge					
Pre-test	14.33(3.70)	13.08(4.29)	13.23(4.60)	.341	.018
Post-test	14.23(4.48)	12.89(5.23)	13.20(4.78)	.421	.014
6. MHLoC					
Pre-test	24.86(5.05)	23.92(4.73)	24.45(4.99)	.697	.006
Post-test	24.49(5.21)	25.06(4.74)	23.54(5.25)	.423	.015

*Note.* BMI = Body Mass Index; AFAT = Anti-fat Attitudes Test; PWE = Protestant Work Ethic; MHLoC = Multidimensional Health Locus of Control. For analyses involving AFAT and MHLoC scores,  $n = 41, 37,$  and  $44.$  Bonferroni correction  $.05/10 = .005.$

## **Measures**

### ***Demographic Information***

Participants were asked for demographic information, including age, gender, sexual orientation, race/ethnicity, and education.

### ***Race/Ethnicity***

Participants were asked to identify their race/ethnicity and provided with a number of options in addition to an opportunity to write in an option that was not listed. Due to small samples size of many racial/ethnic groups and a relatively large proportion of the sample identifying as Caucasian (71.0%), the variable for analyses was developed by grouping participants into two groups: Caucasian and non-Caucasian.

### ***Body Mass Index (BMI)***

Participant height and weight were measured by self-report, given research indicating good reliability between self-reported and measured height and weight (Quick et al., 2014). BMI was calculated using the English formula: ratio of weight (in pounds) to squared height (in inches) multiplied by 703. BMI is often used as a variable in body image and obesity research to account for the effects of body mass. Higher BMI values represent higher levels of body mass (Deurenberg, Weststrate, & Seidell, 1991).

### ***Protestant Work Ethic***

The Protestant Work Ethic scale (Mirel & Garrett, 1971) was used to assess the extent to which participants view circumstances as resulting from individuals' behavior.

This scale contains 19 items and uses a seven-point Likert scale from “I disagree strongly” to “I agree strongly.” Higher scores reflect a greater likelihood to attribute situations to character or effort. An example item is “People who fail at a job have usually not tried hard enough.” The Protestant Work Ethic scale has shown adequate internal consistency (Kuder-Richardson reliability = .79) and validity (Mirel & Garrett, 1971), and it is generally considered to be the most reliable scale measuring Protestant work ethic (Bozkurt, Bayram, Furnham, & Dawes, 2010). For the current study, the Cronbach’s alpha was .75.

### ***Health Behavior Knowledge***

Two subscales from the Nutrition Knowledge Questionnaire (NKQ; Parmenter & Wardle, 1999) were used to measure nutrition knowledge. The NKQ consists of four subscales (dietary recommendations, food sources, food choices, and diet-disease relationship); the current study used the four-item subscale examining dietary recommendations (example item: “How many servings of fruit and vegetables a day do you think experts are advising people to eat?”) and the 10-item subscale on diet-disease relationship (example item: “Are you aware of any major health problems or diseases that are related to how much sugar people eat?”). Each of the 14 items is scored for accuracy (i.e., coded “0” for inaccurate and “1” for accurate responses) and the points are added to make the composite, with higher scores indicating more accurate health knowledge. This scale has shown good reliability and validity and high correlations with related constructs with Cronbach’s alphas for the subscales ranging from 0.70 to 0.97. Test-retest reliability of the subscales ranged from 0.80 to 0.97, with overall reliability at 0.98 (Parmenter &

Wardle, 1999). For the current study, the Cronbach's alpha was .76 pre-test and .86 post-test.

To measure knowledge of exercise recommendations, six multiple-choice questions on exercise knowledge derived from Morrow, Krzewinski-Malone, Jackson, Bungum, and Fitzgerald (2004) were used. These items are scored "0" for correct and "1" for incorrect, with the items added to produce a total score. Higher scores indicate greater accuracy of exercise knowledge. An example item is "What is the minimum length of time (in minutes) one needs to be physically active throughout the day in order to achieve a health benefit?" While this method has been used in the past (Fielder-Jenks, 2010), no reliability data was available for this measure. However, no alternative measures of exercise knowledge could be found. For the current study, the Cronbach's alpha was .41 pre-test and .70 post-test. Although hypotheses included measures of both nutrition knowledge and exercise knowledge, analyses including this measure should be interpreted with caution due to its poor reliability.

### ***Health Locus of Control***

Health locus of control was examined using forms A and B of the Multidimensional Health Locus of Control (MHLoC) scales (Wallston, Wallston, & DeVellis, 1978). These scales examine a person's views on the controllability of his or her health. There exist five subscales: Internal, Chance, Powerful Others, Doctors, and Other People. The Internal subscale was used for this study. Each form has 18 questions on a scale from 1 ("strongly disagree") to 6 ("strongly agree"). Forms A and B are equivalent, and such are designed to be administered before and after the administration

of the experimental condition to measure change. An example item is “When I get sick, I am to blame.” The MHLoC scales have been shown to have good validity (Wallston, 2005). For the current study, the Cronbach’s alpha was .81 for Form A and .84 for Form B.

### ***Weight Stigmatization***

The 47-item Anti-fat Attitudes Test (AFAT; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997) was used to measure beliefs, emotions, and behavioral dispositions toward individuals with obesity. It uses a five-point Likert-type scale ranging from “strongly disagree” to “strongly agree.” An example item is “Most fat people are lazy.” The AFAT and its three subscales (social and character disparagement; physical and romantic unattractiveness; and causal attributions of obesity and blame) has shown good internal consistency (Lewis et al., 1997). The total score was used for the current study, and the Cronbach’s alpha was .93 pre-test and .94 post-test.

### **Experimental Conditions and Stimuli**

Three news articles were used as stimulus material: “Lighten up, dieters! Focus on health, not weight” from The Seattle Times (Dennett, 2014) as the health-focused article and “A Label Calls Attention to Obesity” from The New York Times (Brody, 2013) as the weight-focused article. A control article, “Debate on climate change should be over” from the Seattle Times (Seattle Times Editorial Board, 2015) was also used. These three articles were chosen by the author with the assistance from members of her research lab which focuses on research in the areas of obesity and disordered eating. A

number of articles were reviewed by the author and her research mentor. From these articles, two for each condition were selected for review. Lab members were asked for their opinions on the articles' representativeness, cogency, and readability. One article for each condition was chosen based on the feedback given by the lab members. The selected articles were considered to be representative of the two different health frames and a non-weight or health related frame by a majority of the research group.

### **Procedure**

Individuals interested in the study accessed the provided URL for the Qualtrics survey and read and acknowledged the informed consent document. Those who were eligible were then invited to complete the study. First, questionnaires containing questions on demographic information, self-reported height and weight, Protestant work ethic, health behavior knowledge, health locus of control, and weight stigmatization were administered. The participants were then randomly assigned to read an article emphasizing health, an article emphasizing weight, or a control article. Next, the questionnaires consisting of questions on health behavior knowledge, health locus of control, and weight stigmatization were re-administered to assess change from pre- to post-test. Following completion of the questionnaires, participants were debriefed about the study by a paragraph on the final page of the online survey. Study participation took approximately 45 minutes to 1 hour. Students received course credit for participation, and community participants were given the opportunity to submit their email addresses in a drawing for one of twenty \$25 gift cards to Amazon.com.

## Data Analysis

Analyses were performed using SPSS Version 21. To examine the influence of health report framing on health behavior knowledge and health locus of control, a series of two-way mixed factorial ANOVAs were completed (see Table 3 for independent and dependent variables and covariates for analyses). One three-way mixed factorial ANCOVA was conducted to examine the influence of health behavior framing and ethnicity on anti-fat attitudes and to examine the interactions between health behavior framing and the covariates, Protestant work ethic and BMI. A Bonferroni correction was not implemented due to low power and a small number of analyses.

**Table 3.** Variables involved in study analyses

Analysis #	Independent Variables		Dependent Variable	Covariates
	Between-Groups	Within-Groups		
1	Article Type	Pre/Post-test	Nutrition Knowledge	None
2	Article Type	Pre/Post-test	Exercise Knowledge	None
3	Article Type Ethnicity	Pre/Post-test	Anti-fat Attitudes	Protestant Work Ethic BMI
4	Article Type	Pre/Post-test	Health Locus of Control	None

## CHAPTER FOUR

### RESULTS

Prior to conducting analyses, data were screened for missingness, outliers, and violations of the assumptions of ANOVA and ANCOVA, including normality. While some outliers were found (i.e.,  $z$ -score  $\pm 3$ ), they were not extreme and were left intact to preserve the integrity of the data. Data were found to be normal, with no extreme values of skewness or kurtosis. Preliminary analyses using ANOVA were conducted for article type to ensure no significant differences in group pre-test and post-test scores, Protestant work ethic ideology, BMI, or age. A Bonferroni correction was implemented ( $.05/10 = .005$ ) and no group differences were found, all  $p > .005$ .

#### Hypothesis 1

It was hypothesized that participants reading either the Health Improvement article or the Weight Loss article would report increased diet and exercise knowledge from pre- to post-test, while those exposed to the Control article would show no change in diet and exercise knowledge. This hypothesis was not supported. There was no main effect of type of article on diet knowledge ( $p > .30$ , partial  $\eta^2 = .017$ ) or exercise knowledge ( $p > .70$ , partial  $\eta^2 = .004$ ). There was also no main effect of time of measurement (i.e. pre- or post-test) on diet knowledge ( $p > .80$  partial  $\eta^2 = .002$ ) or exercise knowledge ( $p > .15$ , partial  $\eta^2 = .017$ ) overall. In addition, the interaction between time of measurement and type of article was not significant for diet knowledge ( $p > .95$  partial  $\eta^2 = .001$ ) or exercise knowledge ( $p > .50$ , partial  $\eta^2 = .010$ ). Power for the effects ranged from .15. to .30, indicating that with the current number of participants,

there is a 15% to 30% chance of finding a significant effect. Recommended power is .80 (80%).

## **Hypothesis 2**

It was hypothesized that participants reading the Health Improvement article or the Control article would show no differences in anti-fat attitudes from pre- to post-test, while those reading the Weight Loss article would show increased anti-fat attitudes from pre- to post-test. It was also hypothesized that individuals who identified as Caucasian would show higher anti-fat attitudes than those who were not Caucasian and would show a greater increase in these attitudes after reading the Weight Loss article. Finally, it was hypothesized that an interaction between article type and the covariates, Protestant work ethic and BMI, would be present, with higher levels of Protestant work ethic and higher BMI predicting a greater increase in anti-fat attitudes. The majority of hypotheses were not supported. There was no main effect of type of article on anti-fat attitudes ( $p > .75$ , partial  $\eta^2 = .005$ ). There was also no main effect of time of measurement (i.e. pre- or post-test) on anti-fat attitudes ( $p > .10$ , partial  $\eta^2 = .023$ ). There was a significant effect of ethnicity on overall anti-fat attitudes, with Caucasian individuals showing higher levels of anti-fat attitudes,  $F(1,108) = 10.990$ ,  $p < .001$ , partial  $\eta^2 = .092$ . No hypothesized interactions were significant, all  $p > .05$ , all partial  $\eta^2 < .05$ . However, BMI and Protestant work ethic did predict anti-fat attitudes overall ( $p < .015$  and  $< .004$ , respectively), with lower BMI and higher levels of Protestant work ethic predicting higher overall anti-fat attitudes. Power for the effect of article type was .091, indicating that with the current number of participants, there is a 9.1% chance of finding a

significant effect. Power for other non-significant analyses ranged from .066 to .552. Recommended power is .80 (80%).

### **Hypothesis 3**

It was hypothesized that participants reading either the Health Improvement article or the Weight Loss article would show increased internal health locus of control from pre- to post-test, while those reading the Weight Loss article would show no change in health locus of control. This hypothesis was not supported. There was no main effect of type of article on internal locus of control ( $p > .70$ , partial  $\eta^2 = .006$ ). There was also no main effect of time of measurement (i.e. pre- or post-test) on internal locus of control ( $p > .81$ , partial  $\eta^2 = .001$ ). In addition, the interaction between article type and time of measurement was not significant ( $p > .20$ , partial  $\eta^2 = .025$ ). Power for the effect of article type was .10, indicating that with the current number of participants, there is a 10% chance of finding a significant effect. Recommended power is .80 (80%).

## **CHAPTER FIVE**

### **DISCUSSION**

The current study examined differential effects of three article types, Health Improvement, Weight Loss, or Control, on health behavior knowledge, anti-fat attitudes, and health locus of control. Protestant work ethic, ethnicity, and BMI were also explored as moderators in the relationship between type of article and change in anti-fat attitudes. The majority of hypotheses were not supported, with no dependent variables changing significantly over time and type of article not showing a significant effect on change in the dependent variables. While the covariates did predict anti-fat attitudes overall, no interactions between the covariates and the main effects were significant.

#### **Health Knowledge**

Hypothesis 1 stated that participants reading the Health Improvement article or the Weight Loss article would show an increase in diet and exercise knowledge from pre- to post-test, while those reading the Control article would show no change. This hypothesis was not supported; there were no differences among article type in diet and exercise knowledge from pre- to post-test. This is in line with findings by Saguy et al. (2014) that news articles do not tend to influence knowledge of health behaviors in those who read them. As in the study by Saguy et al. (2014), the current study included an article emphasizing personal responsibility. Saguy et al.'s (2014) study also examined the effects of an article with a Health at Every Size frame, while the current study examined a frame involving health improvement without an emphasis on weight loss. None of these frames appeared to cause a change in participants' knowledge of health behaviors. It may

be that news articles, even those that do not emphasize weight loss as the main method of improving health, are not helpful for increasing health behavior knowledge.

However, there may be other factors that explain the lack of an effect of article type on health behavior knowledge. It may be that the articles in this study do not provide the specific information examined in the measures of health behavior knowledge. To maximize external validity, published articles from actual news sources were used. While this improved generalizability, it made it more difficult to control for other factors of the articles such as tone, length, and exact content and to include all of the information measured in the diet and exercise scales. For example, neither the Health Improvement nor the Weight Loss article directly reported the number of fruits and vegetables individuals are recommended to consume, but the measure of nutrition asked participants, “How many servings of fruit and vegetables a day do you think experts are advising people to eat?” In addition, the Health Improvement article is quite a bit longer than either the Weight Loss or control article, which could lead to loss of attention. There are also very limited measures of diet and exercise knowledge with strong psychometric properties, which rendered it even more of a challenge to effectively measure health knowledge. Finally, the power of the analysis was greatly limited by the small sample size, making it difficult to determine whether the lack of findings is due to this low power or due to the actual absence of an effect.

### **Anti-fat Attitudes**

Hypothesis 2 stated that participants reading the Weight Loss article would show increased anti-fat attitudes from pre- to post-test, while those reading the Health

Improvement or the Control article would not show changes. Contrary to this hypothesis, there were no differences found in the effect of article type on anti-fat attitudes. This finding is inconsistent with prior research suggesting that such articles contribute to weight stigma. Saguy et al. (2014) showed that news articles tend to increase stigmatizing attitudes, especially when focused on weight loss. In addition, Simpson et al. (2017) reported that public health campaigns focused on weight tend to increase negative perceptions of obesity. It may be that there are no differential effects of article type on anti-fat attitudes. It is also possible that this sample, which primarily contained individuals recruited from the social networking site Reddit.com, may respond differently to stigmatizing content than individuals examined in other studies. However, it is likely that other factors are at work.

Specifically, it is possible that the articles chosen for this study were too similar to one another to cause different effects in those who read them. For example, both the Health Improvement and the Weight Loss articles address changing behaviors as a means to improve physical health. Another potential explanation is that the article chosen for the Weight Loss condition contained less stigmatizing information than those included in the studies by Saguy et al. (2014) or the information included in studies of public health campaigns (Puhl et al., 2013; Simpson et al., 2017). In addition, this study used the Antifat Attitudes Test, while Saguy et al (2014) used three separate measures of anti-fat attitudes: the Dislike of Fat People Scale (Crandall, 1994), the Anti-fat Attitudes Scale (Morrison & O'Connor, 1999), and the Fat Phobia Scale (Bacon et al., 2001). It is possible that this study's measure of weight stigma may not encompass all of the areas examined by Saguy et al. (2014). In their analyses using the Anti-fat Attitudes Scale,

which is the most similar in terms of item content to the Antifat Attitudes Test, Saguy et al. did find a significant effect of article type on stigmatizing attitudes. This lends the final potential reason for finding no main effect more credence: the analyses used for this hypothesis were likely affected by low power from a small sample size. Analyses indicated small-to-medium effect sizes, which suggests that that a significant effect may require a larger sample size to be found.

### **Health Locus of Control**

Hypothesis 3 stated that the type of article would predict a change in health locus of control, such that participants reading the Health Improvement or Weight Loss article would show increased health locus of control, while those reading the Control article would show no change in this variable. This hypothesis was not supported, in contrast to a recent study by Simpson et al. (2017) that indicated that weight-focused public health campaigns predicted lower self-efficacy than weight-neutral campaigns. An earlier study by Puhl et al. (2013) also found viewing weight-focused public health campaigns to predict lower self-efficacy. Both studies reported that campaigns promoting health behaviors, such as increasing physical activity and fruit and vegetable consumption, predicted higher self-efficacy and lower stigmatizing attitudes than those that mentioned weight, weight loss, or obesity; however, both studies focused on public health campaigns, rather than news articles. In fact, there has been no research specifically on the influence of news articles on health locus of control; thus, it may be that news articles have a different effect, or a lack of effect, on health locus of control than public health campaigns.

There are several potential reasons that this study had differing results. First, the current study examined the effects of news articles aimed at improving health, while studies by Simpson et al. (2017) and Puhl et al. (2013) examined the effect of obesity prevention public health campaigns. Both the intention of the message and the mode of delivery differ between the two types of media, and this may have affected the results. Studies using public health campaigns also have the added benefit of more control over what information is presented to participants, which improves consistency among the different conditions. However, it is also possible that the low power of the current study played a role in the lack of significant findings. A larger sample size would be important to obtain so that this potential confound can be ruled out.

### **Limitations and Strengths**

The current study has some limitations that are important to consider. The number and complexity of analyses proposed, along with the small-to-medium effect sizes, would require a very large effect for the current sample size ( $n = 124$ ) to have enough power to find the predicted relationships, if they were present. Thus, the findings of the current study should be interpreted with caution. In addition, while the study was developed with an intention to examine ethnicity as a moderating variable, the sample was primarily Caucasian. Because of this, the sample did not include as much ethnic diversity as would be needed to examine each group separately. The necessary dichotomization of the ethnicity variable into two groups reduced the variance that could otherwise be accounted for. In addition, validated measures of nutrition and exercise knowledge could not be found; therefore, some of the measures used had poor reliability, which could lead to

attenuation of the proposed relationships. The choice to use actual news articles rather than creating them for the study also made it difficult to control for differences among the articles that may have introduced additional confounds into the study. Finally, the design of the study involved taking some measures more than once. While one measure (the MHLoC scale) had two forms to limit practice effects, the other post-test measures did not have alternate forms. It is possible that practice effects may explain some of the change in the dependent variables from pre-test to post-test.

Despite the study limitations, there are strengths of this study. The sample included many participants from the website Reddit.com, the members of which have been reported in the news as having strong anti-fat biases (Dewey, 2015); however, these biases have not yet been tested against other populations. Although this was not the main purpose of the study, these data offer an important opportunity to examine these claims of anti-fat attitudes, as well as to explore both weight bias and potential means to reduce such bias in this population. Finally, this study is the first to examine the effects of a health behavior-focused news article that does not emphasize weight loss as a goal. Given recent studies indicating that emphasizing weight loss is likely ineffective for improving health and frequently increases anti-fat attitudes (Puhl et al., 2013; Saguy et al., 2014; Simpson et al., 2017), as well as the strong evidence that experiencing these stigmatizing attitudes predicts poor physical and mental health (Hilbert et al., 2014; Puhl & Brownell, 2014), finding alternative ways to present health information is essential, and research in this area is warranted. The current study provides a possible avenue to examine the effect of these methods.

## **Implications and Future Directions**

This study would be greatly improved with a larger sample size, and it would be helpful for future studies to explore methods of data collection that will ensure appropriate power for the desired analyses. Possible methods may include using a large, paid survey platform such as SurveyMonkey or Amazon Mechanical Turk, or providing additional compensation to participants. In addition, while this study used already-published news articles, future studies may benefit from altering published news articles to add or remove coverage of weight loss. Such experimental manipulations would likely reduce the number of differences between the Health Improvement and Weight Loss articles and prevent the inclusion of additional confounds. Furthermore, it would be beneficial to include specific health information in the article and test participants on knowledge of this information, even if that would involve developing and validating new measures of health information. This could also reduce confounding variables and improve confidence in any effects found.

## **Conclusions**

The aims of this study were to examine the impact of three article types (Health Improvement, Weight Loss, and Control) on changes in health behavior knowledge, anti-fat attitudes, and health locus of control and to examine the Protestant work ethic, ethnicity, and BMI as moderators in the relationship between article type and anti-fat attitudes. No study hypotheses were supported, with neither article type nor time of measurement predicting any difference in the dependent variables; in addition, no moderators were significant. While there are many possible reasons for the lack of

findings, the low statistical power of the study is the most likely, and results of the study should be interpreted with caution until more data are collected.

## REFERENCES

- Allison, D. B., Basile, V. C., & Yunker, H. E. (1991). The measurement of attitudes toward and beliefs about obese persons. *International Journal of Eating Disorders, 10*(5), 599-607.
- Anderson, J. W., Konz, E. C., Frederich, R. C., Wood, C. L. (2001). Long-term weight-loss maintenance: A meta-analysis of US studies. *Am J Clin Nutr, 74*(5), 579-584.
- Annis, N. M., Cash, T. F., & Hrabosky, J. I. (2004). Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: The role of stigmatizing experiences. *Body Image, 1*(2), 155-167.
- Ashmore, J. A., Friedman, K. E., Reichmann, S. K., & Musante, G. J. (2008). Weight-based stigmatization, psychological distress, & binge eating behavior among obese treatment-seeking adults. *Eating Behaviors, 9*(2), 203-209.
- Bacon, J. G., Scheltema, K. E., & Robinson, B. E. (2001). Fat phobia scale revisited: the short form. *International journal of obesity, 25*(2), 252.
- Blackburn, G. L., Wilson, G. T., Kanders, B. S., Stein, L. J., Lavin, P. T., Adler, J., & Brownell, K. D. (1989). Weight cycling: The experience of human dieters. *Am J Clin Nutr, 49*, 1105-9.
- Boero, N. (2007). All the news that's fat to print: The American "obesity epidemic" in the media. *Qual Sociol, 30*, 41-60.
- Bozkurt, V., Bayram, N., Furnham, A., & Dawes, Glenn. (2010). The Protestant work ethic and hedonism among Kyrgyz, Turkish, and Australian college students. *Drustvena Istrazivanja: Journal for General Social Issues, 19*(4-5), 749069.
- Branscombe, N. R., Schmitt, M. T., & Harvey, R. D. (1999). Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *Journal of Personality and Social Psychology, 77*(1), 135-49.
- Bray, G. A. (2001). Drug treatment of obesity. *Reviews in Endocrine and Metabolic Disorders, 2*, 403-18.
- Brochu, P. M., Pearl, R. L., Puhl, R. M., & Brownell, K. D. (2014). Do media portrayals of obesity influence support for weight-related medical policy? *Health Psychology, 33*(2), 197-200.
- Brody, J. E. (2013, July 2). A label calls attention to obesity. *The New York Times*, p. D7.
- Brody, J. E. (2015, June 30). With summer sun comes signs of danger. *The New York Times*, p. D5.
- Brownell, K. D. & Rodin, J. (1994). Medical, metabolic, and psychological effects of weight cycling. *Arch Intern Med, 154*(12), 1325-30.

- Butryn, M. L., Webb, V., & Wadden, T. A. (2011). Behavioral treatment of obesity. *Psychiatry Clinics of North America*, *34*, 841-59.
- Campos, P., Saguy, A., Ernsberger, P., Oliver, E., & Gaesser, G. (2006). The epidemiology of overweight and obesity: Public health crisis or moral panic? *International Journal of Epidemiology*, *15*, 55-60.
- Carels, R. A., Young, K. M., Wott, C. B., Harper, J., Gumble, A., Oehlof, M. W., & Clayton, A. M. (2009). Weight bias and weight loss treatment outcomes in treatment-seeking adults. *Annals of Behavioral Medicine*, *37*(3), 350-355.
- Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior*, *46*(3), 244-259.
- Carr, D., Jaffe, K. J., & Friedman, M. A. (2008). Perceived interpersonal mistreatment among obese Americans: Do race, class, and gender matter? *Obesity*, *16*(S2), 60-68.
- Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology*, *66*(5), 882-94.
- Centers for Disease Control and Prevention. (2015). Overweight and obesity. Retrieved from <http://www.cdc.gov/obesity/index.html>
- Cooper, Z., Doll, H. A., Hawker, D. M., Byrne, S., Bonner, G., Eeley, E., . . . & Fairburn, C. (2010). Testing a new cognitive behavioural treatment for obesity: A randomized controlled trial with three-year follow-up. *Behavior Research and Therapy*, *48*, 706-13.
- Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology*, *66*(5), 882-94.
- Dennett, C. (2014, July 13). Lighten up, dieters! Focus on health, not weight. *The Seattle Times*, retrieved from <http://www.seattletimes.com/seattle-news/health/lighten-up-dieters-focus-on-health-not-weight/>
- Deurenberg, P., Weststrate, J. A., & Seidell, J. C. (1991). Body mass index as a measure of body fatness: Age- and sex-specific prediction formulas. *British Journal of Nutrition*, *65*, 105-14.
- Dewey, C. (2015, June 12). Censorship, fat-shaming, and the ‘Reddit revolt’: How Reddit became the Alamo of the Internet’s ongoing culture war. *The Washington Post*, retrieved from [https://www.washingtonpost.com/news/the-intersect/wp/2015/06/12/censorship-fat-shaming-and-the-reddit-revolt-how-reddit-became-the-alamo-of-the-internets-ongoing-culture-war/?utm\\_term=.c5cad0f60496](https://www.washingtonpost.com/news/the-intersect/wp/2015/06/12/censorship-fat-shaming-and-the-reddit-revolt-how-reddit-became-the-alamo-of-the-internets-ongoing-culture-war/?utm_term=.c5cad0f60496)
- Fielder-Jenks, C. R. (2010). Can health behaviors and motives predict college students’ self-esteem? *Psi Chi Journal of Undergraduate Research*, *15*(3), 143-9.
- Fisher, B. L. & Schauer, P. (2002). Medical and surgical options in the treatment of severe obesity. *The American Journal of Surgery*, *184*, 9S-16S.

- Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: A systematic review and meta-analysis. *JAMA*, *309*(1), 71-82.
- Friedman, K. E., Ashmore, J. A., & Applegate, K. L. (2008). Recent experiences of weight-based stigmatization in a weight loss surgery population: Psychological and behavioral correlates. *Obesity*, *16*(S2), S69-S74.
- Friedman, K. E., Reichmann, S. K., Costanzo, P. R., Zelli, A., Ashmore, J. A., & Musante, G. J. (2005). Weight stigmatization and ideological beliefs: Relation to psychological functioning in obese adults. *Obesity*, *13*(5), 907-916.
- Giles, E. D., Steig, A. J., Jackman, M. R., Higgins, J. A., Johnson, G. C., . . . & MacLean, P. S. (2016). Exercise decreases lipogenic gene expression in adipose tissue and alters adipocyte cellularity during weight regain after weight loss. *Front Physiol*, *7*(32), doi: [10.3389/fphys.2016.00032](https://doi.org/10.3389/fphys.2016.00032)
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York, NY: Simon & Schuster.
- Gollust, S. E., Eboh, I., & Barry, C. L. (2012). Picturing obesity: Analyzing the social epidemiology of obesity conveyed through US news media images. *Social Science and Medicine*, *74*, 1544-51.
- Grabe, S. & Hyde, J. S. (2006). Ethnicity and body dissatisfaction among women in the United States: A meta-analysis. *Psychological Bulletin*, *132*(4), 622-40.
- Greenleaf, C., Chambliss, H., Rhea, D. J., Martin, S. B., & Morrow Jr, J. R. (2006). Weight stereotypes and behavioral intentions toward thin and fat peers among white and Hispanic adolescents. *Journal of Adolescent Health*, *39*(4), 546-552.
- Greenleaf, C., Petrie, T A., & Martin, S. B. (2014). Relationship of weight-based teasing and adolescents' psychological well-being and physical health. *J Sch Health*, *84*, 49-55.
- Grodstein, F., Levine, R., Troy, L., Spencer, T., Colditz, G. A., & Stampfer, M. J. (1996). Three-year follow-up of participants in a commercial weight loss program. Can you keep it off? *Arch Intern Med*, *156*(12), 1302-1306.
- Guagnano, M. T., Ballone, E., Pace-Palitti, V., Vecchia, R. D., D'Orazio, N., Manigrasso, M. R., . . . & Sensi, S. (2000). Risk factors for hypertension in obese women: The role of weight cycling. *European Journal of Clinical Nutrition*, *54*(4), 356-60.
- Gudzune, K. A., Bennett, W. L., Cooper, L. A., & Bleich, S. N. (2014). Perceived judgment about weight can negatively influence weight loss: A cross-sectional study of overweight and obese patients. *Preventative Medicine*, *62*, 103-7.
- Harris, M. B., & Smith, S. D. (1982). Beliefs about obesity: Effects of age, ethnicity, sex and weight. *Psychological Reports*, *51*(3f), 1047-1055.
- Hebl, M. R. & Heatherton, T. F. (1998). The stigma of obesity in women: The difference is black and white. *Personality and Social Psychology Bulletin*, *24*(4), 417-26.

- Hilbert, A., Braehler, E., Winfried, H., & Zenger, M. (2014). Weight bias internalization, core self-evaluation, and health in overweight and obese persons. *Obesity*, 22(1), 79-85.
- Kahn, S. E., Hull, R. L., & Utzschneider, K. M. (2006). Mechanisms linking obesity to insulin resistance and type 2 diabetes. *Nature*, 444, 840-846.
- Kaminsky, J., & Gadaleta, D. (2002). A Study of discrimination within the medical community as viewed by obese patients. *Obesity Surgery*, 12(1), 14-18.
- Kirkland, A. (2008). Think of the hippopotamus: Rights consciousness in the fat acceptance movement. *Law & Society Review*, 42(2), 397-432.
- Krzewinski-Malone, J., Jackson, A. W., Bungum, T. J., & Fitzgerald, S. J. (2004). American adults' knowledge of exercise recommendations. *Research Quarterly for Exercise and Sport*, 75(3), 231-7.
- LaRosa, J. (2013, April 16). Weight loss market in U.S. up 1.7% to \$61 billion. *PRWeb*. Retrieved from <http://www.prweb.com/pdfdownload/10629316.pdf>
- Latner, J. D., Stunkard, A. J., & Wilson, G. T. (2005). Stigmatized students: Age, sex, and ethnicity effects in the stigmatization of obesity. *Obesity*, 13(7), 1226-1231.
- Lawrence, R. G. (2004). Framing obesity: The evolution of news discourse on a public health issue. *The Harvard International Journal of Press/Politics*, 9, 56-75.
- Lewis, R. J., Cash, T. F., Jacobi, L., & Bubb-Lewis, C. (1997). Prejudice toward fat people: The development and validation of the Anti-fat Attitudes Test. *Obesity Research*, 5, 297-307.
- MacLean, P. S., Higgins, J. A., Giles, E. D., Sherk, V. D., & Jackman, M. R. (2015). The role for adipose tissue in weight regain after weight loss. *Obesity Reviews*, 16, 45-54. doi:10.1111/obr.12255
- Major, B., Hunger, J. M., Bunyan, D. P., & Miller, C. T. (2014). The ironic effects of weight stigma. *Journal of Experimental Social Psychology*, 51, 74-80.
- Mann, T., Tomiyama, A. J., Westling, E., Lew, A. M., Samuels, B., & Chatman, J. (2007). Medicare's search for effective obesity treatments: Diets are not the answer. *Am Psychol*, 62(3), 220-33.
- Mayo Clinic. (2015). Obesity. Retrieved from <http://www.mayoclinic.org/diseases-conditions/obesity/basics/treatment/con-20014834>.
- Mechanick, J. I., Kushner, R. F., Sugerman, H. J., Gonzalez-Campoy, J. M., Collazo-Clavell, M. L., . . . & Dixon, J. (2008). American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic & Bariatric Surgery Medical Guidelines for clinical practice for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient. *Surgery for Obesity and Related Diseases*, 4, S109-84.

- Mirels, H. L. & Garrett, J. B. (1971). The Protestant ethic as a personality variable. *Journal of Consulting and Clinical Psychology, 36*(1), 40-44.
- Parmenter, K., & Wardle, J. (1999). Development of a general nutrition knowledge questionnaire for adults. *European Journal of Clinical Nutrition, 53*, 298-308.
- Morrison, T. G., & O'connor, W. E. (1999). Psychometric properties of a scale measuring negative attitudes toward overweight individuals. *The Journal of Social Psychology, 139*(4), 436-445.
- Nammi, S., Koka, S., Chinnala, K. M., & Boini, K. M. (2004). Obesity: An overview on its current perspectives and treatment options. *Nutrition Journal, 3*(3), np.
- National Heart, Lung, and Blood Institute. (2012). What are the health risks of overweight and obesity? Retrieved from <http://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks.html>
- Nestle, M. & Jacobson, M. F. (2000). Halting the obesity epidemic: A public health policy approach. *Public Health Reports, 115*(1), 12-24.
- Parmenter, K., & Wardle, J. (1999). Development of a general nutrition knowledge questionnaire for adults. *European Journal of Clinical Nutrition, 53*, 298-308.
- Pearl, R. L., Puhl, R. M., & Brownell, K. D. (2012). Positive media portrayals of obese persons: Impact on attitudes and image preferences. *Health Psychology, 31*(6), 821-9.
- Penedo, F. J. & Dahn, J. R. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry, 18*(2), 189-93.
- Phelan, S. M., Burgess, D. J., Yeazel, M. W., Hellerstedt, W. L., Griffin, J. M., & van Ryn, M. (2015). Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obesity Reviews, 16*(4), 319-326.
- Puhl, R. M. & Brownell, K. D. (2003). Psychosocial origins of obesity stigma: Toward changing a powerful and pervasive bias. *Obesity Reviews, 4*, 213-27.
- Puhl, R., Luedicke, J., Peterson, J. L. (2013). Public reactions to obesity-related health campaigns: A randomized controlled trial. *Am J Prev Med, 45*(1), 36-48.
- Puhl, R. M., Moss-Racusin, C. A., & Schwartz, M. B. (2007). Internalization of weight bias: Implications for binge eating and emotional well-being. *Obesity, 15*(1), 19-23.
- Puhl, R., Peterson, J. L., & Luedicke, J. (2012). Fighting obesity or obese persons? Public perceptions of obesity-related health messages. *International Journal of Obesity, 0*, 1-9.
- Quick V, Byrd-Bredbenner C, Shoff S et al. (2015) Concordance of self-report and measured height and weight of college students. *Journal of Nutrition Education and Behavior, 47*(1); 94-98.

- Quinn, D. M. & Crocker, J. (1999). When ideology hurts: Effects of belief in the protestant ethic and feeling overweight on the psychological well-being of women. *Journal of Personality and Social Psychology*, 77(2), 401-14.
- Rosenthal, L., Earnshaw, V., Carroll-Scott, A., Henderson, K. E., Peters, S. M., McCaslin, C., & Ickovics, J. R. (2015). Weight- and race-based bullying: Health associations among urban adolescents. *J Health Psychology*, 20(4), 401-12).
- Rich, S. S., Essery, E. V., Sanborn, C. F., DiMarco, N. M., Morales, L. K., & LeClere, S. M. (2008). Predictors of body size stigmatization in Hispanic preschool children. *Obesity*, 16, S11-S17.
- Sacks, G., Swinburn, B., & Lawrence, M. (2009). Obesity policy action framework and analysis grids for a comprehensive policy approach to reducing obesity. *Obesity Reviews*, 10, 76-86.
- Saguy, A. C. & Almeling, R. (2008). Fat in the fire? Science, the news media, and the “obesity epidemic.” *Sociological Forum*, 23(1), 53-83.
- Saguy, A. C. & Gruys, K. (2010). Morality and health: News media constructions of overweight and eating disorders. *Social Problems*, 57(2), 231-50.
- Saguy, A. C., Frederick, D., & Gruys, Kjerstin. (2014). Reporting risk, producing prejudice: How news reporting on obesity shapes attitudes about health risk, policy, and prejudice. *Social Science and Medicine*, 111, 125-33.
- Schvey, N. A., Puhl, R. M., & Brownell, K. D. (2014). The stress of stigma: Exploring the effect of weight stigma on cortisol reactivity. *Psychosomatic Medicine*, 76(2), 156-62.
- Schwartz, M. B., Vartanian, L. R., Nosek, B. A., & Brownell, K. D. (2006). The influence of one’s own body weight on implicit and explicit anti-fat bias. *Obesity*, 14(3), 440-447.
- Seattle Times Editorial Board. (2015, March 12). Debate on climate change should be over. *The Seattle Times*, retrieved from <http://www.seattletimes.com/opinion/editorials/debate-on-climate-change-should-be-over/>
- Simpson, C. C., Griffin, B. J., & Mazzeo, S. E. (2017). Psychological and behavioral effects of obesity prevention campaigns. *Journal of Health Psychology*, DOI: <https://doi.org/10.1177/1359105317693913>
- Singh-Manoux, A., Adler, N. E., & Marmot, M. G. (2003). Subjective social status: Its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science & Medicine*, 56(6), 1321-33.
- Stice, E., Shaw, H., & Marti, N. (2006). A meta-analytic review of obesity prevention programs for children and adolescents: The skinny on interventions that work. *Psychological Bulletin*, 132(5),

- Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2011). Long-term persistence of hormonal adaptations to weight loss. *N Engl J Med*, *365*, 1597-1604.
- Thaiss, C. A., Itav, S., Rothschild, D., Meijer, M. T., Levy, M., . . . & Elinav, E. (2016). Persistent microbiome alterations modulate the rate of post-dieting weight regain. *Nature*, *540*, 544-551.
- Tomiya, A. J. (2014). Weight stigma is stressful. A review of evidence for the cyclic obesity/weight-based stigma model. *Appetite*, *82*, 8-15.
- Tsai, A. G. & Wadden, T. A. (2005). Systematic review: An evaluation of major commercial weight loss programs in the United States. *Annals of Internal Medicine*, *142*, 56-66.
- Tylka, T. L., Annunziato, R. A., Burgard, D., Danielsdottir, S., Shuman, E., Davis, C., & Calogero, R. M. (2014). The weight-inclusive versus weight-normative approach to health: Evaluating the evidence for prioritizing well-being over weight loss. *Journal of Obesity*, 1-18.
- U.S. Department of Health and Human Services. (2001). The Surgeon General's call to action to prevent and decrease overweight and obesity. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General. Available from: U.S. GPO, Washington.
- van den Berg, P., Neumark-Sztainer, D., Eisenberg, M. E., & Haines, J. (2008). Racial/ethnic differences in weight-related teasing in adolescents. *Obesity*, *16*, S3-S10.
- Vartanian, L. R. & Novak, S. A. (2011). Internalized societal attitudes moderate the impact of weight stigma on avoidance of exercise. *Obesity*, *19*(4), 757-62.
- Vartanian, L. R., & Shaprow, J. G. (2008). Effects of weight stigma on exercise motivation and behavior. *Journal of Health Psychology*, *13*(1), 131-138.
- Vartanian, L. R. & Smyth, J. M. (2013). Primum non nocere: Obesity stigma and public health. *Bioethical Inquiry*, *10*, 49-57.
- Wadden, T. A., Butryn, M. L., & Wilson, C. (2007). Lifestyle modification for the management of obesity. *Gastroenterology*, *132*, 2226-38.
- Wallston, B. S. & Wallston, K. A. (1978). Locus of control and health: A review of the literature. *Health Education Monographs*, *6*(2), 107-117.
- Wallston, K. A., Wallston, B. S. & DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) scales. *Health Education Monographs*, *6*, 160-170.
- Wallston, K.A. (2005). The validity of the Multidimensional Health Locus of Control Scales. *Journal of Health Psychology*, *10*, 623-631.

- Wang, S. S., Brownell, K. D., & Wadden, T. A. (2004). The influence of the stigma of obesity on overweight individuals. *International Journal of Obesity*, 28(10), 1333-1337.
- Wardle, J., Waller, J., & Rapoport, L. (2001). Body dissatisfaction and eating in obese women: The role of restraint and depression. *Obesity Research*, 9(12), 778-787.
- Weygandt, M., Mai, K., Dommès, E., Ritter, K., Leupelt, V., . . . & Haynes, J. (2015). Impulse control in the dorsolateral prefrontal cortex counteracts post-diet weight regain in obesity. *NeuroImage*, 109, 318-327.
- Wing, R. R. & Phelan, S. (2005). Long-term weight loss maintenance. *Am J Clin Nutr*, 82(1), 2225-2255.
- World Health Organization. (2016). Obesity and overweight. Retrieved from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- Wott, C. B. & Carels, R. A. (2010). Overt weight stigma, psychological distress and weight loss outcomes. *J Health Psychol*, 15(4), 608-14.
- Yu, E., Ley, S. H., Manson, J. E., Willett, W., Satija, A., . . . & Stokes, A. (2017). Weight history and all-cause and cause-specific mortality in three prospective studies. *Annals of Internal Medicine*, Epub ahead of print. doi: 10.7326/M16-1390

## APPENDIX A

### DEMOGRAPHIC INFORMATION

1. Age: \_\_\_\_\_
2. Sex:        Male            Female            Other
3. Do you identify as transgender?            Yes            No
4. What is your sexual orientation?
  - 1 Straight
  - 2 Bisexual
  - 3 Gay
  - 4 Lesbian
  - 5 Other
5. What is your ethnic/racial background?
  - 1 Black (not Hispanic)
  - 2 Hispanic
  - 3 White (not Hispanic)
  - 4 Asian/Pacific Islander
  - 5 Native American/First Nations
  - 6 Multiracial
  - 7 Other (please specify: \_\_\_\_\_)
6. How far did you get in school?
  - 1 Grammar school, junior high school, or less
  - 2 Some high school
  - 3 High school graduate or equivalent (GED)
  - 4 Some college or associate degree
  - 5 Completed bachelor's degree
  - 6 Completed graduate degree
7. How tall are you? \_\_\_\_\_ feet            inches
8. How much do you weigh now? \_\_\_\_\_ lbs.

## APPENDIX B

### PROTESTANT WORK ETHIC SCALE

Please choose the response that best represents your agreement with the item.

I disagree strongly	I disagree somewhat	I disagree slightly	Neutral	I agree slightly	I agree somewhat	I agree strongly
1	2	3	4	5	6	7

1. Most people spend too much time in unprofitable amusements.  
1 2 3 4 5 6 7
2. Our society would have fewer problems if people had less leisure time.  
1 2 3 4 5 6 7
3. Money acquired easily (e.g., through gambling or speculation) is usually spent unwisely.  
1 2 3 4 5 6 7
4. There are few satisfactions equal to the realization that one has done one's best at a job.  
1 2 3 4 5 6 7
5. The most difficult college courses usually turn out to be the most rewarding.  
1 2 3 4 5 6 7
6. Most people who don't succeed in life are just plain lazy.  
1 2 3 4 5 6 7
7. The self-made person is likely to be more ethical than the person born to wealth.  
1 2 3 4 5 6 7
8. I often feel I would be more successful if I sacrificed certain pleasures.  
1 2 3 4 5 6 7
9. People should have more leisure time to spend in relaxation.  
1 2 3 4 5 6 7
10. Any person who is able and willing to work hard has a good chance of succeeding.  
1 2 3 4 5 6 7

11. People who fail at a job have usually not tried hard enough.  
1 2 3 4 5 6 7
12. Life would have very little meaning if we never had to suffer.  
1 2 3 4 5 6 7
13. Hard work offers little guarantee of success.  
1 2 3 4 5 6 7
14. The credit card is a ticket to careless spending.  
1 2 3 4 5 6 7
15. Life would be more meaningful if we had more leisure time.  
1 2 3 4 5 6 7
16. The person who can approach an unpleasant task with enthusiasm is the person who gets ahead.  
1 2 3 4 5 6 7
17. If one works hard enough one is likely to make a good life for oneself.  
1 2 3 4 5 6 7
18. I feel uneasy when there is little work for me to do.  
1 2 3 4 5 6 7
19. A distaste for hard work usually reflects a weakness of character.  
1 2 3 4 5 6 7

## APPENDIX C

### HEALTH BEHAVIOR KNOWLEDGE:

#### DIETARY RECOMMENDATIONS

The first few items are about what advice you think experts are giving us.

1. Do you think health experts recommend that people should be eating more, the same amount, or less of these foods? (*tick one box per food*)

Vegetables	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Sugary foods	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Meat	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Starchy foods	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Fatty foods	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
High fiber foods	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Fruit	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure
Salty foods	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Less	<input type="checkbox"/> Not Sure

2. How many servings of fruit and vegetables a day do you think experts are advising people to eat? (One serving could be, for example, an apple or a handful of chopped carrots)

\_\_\_\_\_

3. Which fat do experts say is most important for people to cut down on? (*tick one*)
- Monounsaturated fat
  - Polyunsaturated fat
  - Saturated fat
  - Not sure
4. What version of dairy foods do experts say people should eat? (*tick one*)
- Full fat
  - Lower fat
  - Mixture of full fat and lower fat
  - Neither, dairy foods should be cut out
  - Not sure

**APPENDIX D**

**HEALTH BEHAVIOR KNOWLEDGE:**

**DIET-DISEASE RELATIONSHIPS**

This section is about health problems or diseases.

1. Are you aware of any major health problems or diseases that are related to a low intake of fruit and vegetables?

- Yes
- No
- Not sure

If yes, what diseases or health problems do you think are related to a low intake of fruit and vegetables?

---

---

---

---

2. Are you aware of any major health problems or diseases that are related to a low intake of fiber?

- Yes
- No
- Not sure

If yes, what diseases or health problems do you think are related to a low intake of fiber?

---

---

---

---

3. Are you aware of any major health problems or diseases that are related to how much sugar people eat?

- Yes
- No
- Not sure

If yes, what diseases or health problems do you think are related to sugar?

---

---

---

---

4. Are you aware of any major health problems or diseases that are related to how much salt or sodium people eat?

- Yes
- No
- Not sure

If yes, what diseases or health problems do you think are related to salt?

---

---

---

5. Are you aware of any major health problems or diseases that are related to the amount of fat people eat?

- Yes
- No
- Not sure

If yes, what diseases or health problems do you think are related to fat?

---

---

---

6. Do you think these help to reduce the chances of getting certain kinds of cancer?  
(answer each one)

- |                                     |                              |                             |                                   |
|-------------------------------------|------------------------------|-----------------------------|-----------------------------------|
| Eating more fiber                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating less sugar                   | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating less fat                     | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating less salt                    | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating more fruits and vegetables   | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating less preservatives/additives | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |

7. Do you think these help prevent heart disease? (answer each one)

- |                           |                              |                             |                                   |
|---------------------------|------------------------------|-----------------------------|-----------------------------------|
| Eating more fiber         | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |
| Eating less saturated fat | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Not Sure |

- Eating less salt  Yes  No  Not Sure
- Eating more fruit and vegetables  Yes  No  Not Sure
- Eating less preservatives/additives  Yes  No  Not Sure
8. Which one of these is more likely to raise people's blood cholesterol level? (*tick one*)
- Antioxidants
  - Polyunsaturated fats
  - Saturated fats
  - Cholesterol in the diet
  - Not sure
9. Have you heard of antioxidant vitamins?
- Yes
  - No
10. If YES to question 9, do you think these are antioxidant vitamins? (*answer each one*)
- Vitamin A  Yes  No  Not Sure
- B Complex Vitamins  Yes  No  Not Sure
- Vitamin C  Yes  No  Not Sure
- Vitamin D  Yes  No  Not Sure
- Vitamin E  Yes  No  Not Sure
- Vitamin K  Yes  No  Not Sure

## APPENDIX E

### EXERCISE KNOWLEDGE

1. What is the minimum number of days per week you believe a person must be physically active in order to receive any health benefit?
  - a. 0-1
  - b. 2
  - c. 3-5
  - d. Not sure
  
2. What is the minimum length of time (in minutes) one needs to be physically active throughout a typical day in order to achieve a health benefit?
  - a. 15
  - b. 20
  - c. 30
  - d. Not sure
  
3. Vigorous levels of physical activity are necessary to provide any health benefits.
  - a. True
  - b. False
  - c. Not sure
  
4. Moderate levels of physical activity do NOT provide any health benefits.
  - a. True
  - b. False
  - c. Not sure
  
5. Ten minutes of physical activity three times per day provide the same health benefits as a single session of 30 minutes.
  - a. True
  - b. False
  - c. Not sure
  
6. Everyone should get 30 minutes of at least moderate physical activity most days of the week.
  - a. True
  - b. False
  - c. Not sure

## APPENDIX F

### MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

#### *Form A*

		SD	MD	D	A	MA	SA
		1=STRONGLY DISAGREE (SD) 2=MODERATELY DISAGREE (MD) 3=SLIGHTLY DISAGREE (D)		4=SLIGHTLY AGREE (A) 5=MODERATELY AGREE (MA) 6=STRONGLY AGREE (SA)			
1	If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2	No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3	Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4	Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5	Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am in control of my health.	1	2	3	4	5	6
7	My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8	When I get sick, I am to blame.	1	2	3	4	5	6

9	Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10	Health professionals control my health.	1	2	3	4	5	6
11	My good health is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14	Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15	No matter what I do, I 'm likely to get sick.	1	2	3	4	5	6
16	If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17	If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18	Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

**Form B**

		<b>SD</b>	<b>MD</b>	<b>D</b>	<b>A</b>	<b>MA</b>	<b>SA</b>
1	If I become sick, I have the power to make myself well again.	1	2	3	4	5	6
2	Often I feel that no matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3	If I see an excellent doctor regularly, I am less likely to have health problems.	1	2	3	4	5	6
4	It seems that my health is greatly influenced by accidental happenings.	1	2	3	4	5	6
5	I can only maintain my health by consulting health professionals.	1	2	3	4	5	6
6	I am directly responsible for my health.	1	2	3	4	5	6
7	Other people play a big part in whether I stay healthy or become sick.	1	2	3	4	5	6
8	Whatever goes wrong with my health is my own fault.	1	2	3	4	5	6
9	When I am sick, I just have to let nature run its course.	1	2	3	4	5	6
10	Health professionals keep me healthy.	1	2	3	4	5	6
11	When I stay healthy, I'm just plain lucky.	1	2	3	4	5	6
12	My physical well-being depends on how well I take care of myself.	1	2	3	4	5	6
13	When I feel ill, I know it is because I have not been taking care of myself properly.	1	2	3	4	5	6
14	The type of care I receive from other people is what is responsible for how well I recover from an illness.	1	2	3	4	5	6
15	Even when I take care of myself, it's easy to get sick.	1	2	3	4	5	6
16	When I become ill, it's a matter of fate.	1	2	3	4	5	6
17	I can pretty much stay healthy by taking good care of myself.	1	2	3	4	5	6
18	Following doctor's orders to the letter is the best way for me to stay healthy.	1	2	3	4	5	6

## APPENDIX G

### ANTI-FAT ATTITUDES TEST (AFAT)

Please answer the following questions as honestly as possible.

1. There's no excuse for being fat.
2. If I were single, I would date a fat person.
3. Jokes about fat people are funny.
4. Most fat people buy too much junk food.
5. Fat people are physically unattractive.
6. Fat people shouldn't wear revealing clothing in public.
7. If someone in my family were fat, I'd be ashamed of him or her.
8. I can't stand to look at fat people.
9. If fat people don't get hired, it's their own fault.
10. Fat people are disgusting.
11. If I have the choice, I'd rather not sit next to a fat person.
12. Fat people don't care about anything except eating.
13. I'd lose respect for a friend who started getting fat.
14. Most fat people are boring.
15. I can't believe someone of average weight would marry a fat person.
16. Society is too tolerant of fat people.
17. When fat people exercise, they look ridiculous.
18. I hate it when fat people take up more room than they should in a theater or on a bus or plane.
19. Most fat people are lazy.
20. Most fat people don't care about anyone but themselves.
21. Fat people are just as competent in their work as anyone.
22. If fat people really wanted to lose weight, they could.
23. Being fat is sinful.
24. It's disgusting to see fat people eating.
25. Fat people have no will power.
26. I prefer not to associate with fat people.
27. Fat people don't care about their appearance.
28. Most fat people are moody and hard to get along with.
29. If bad things happen to fat people, they deserve it.
30. Most fat people don't keep their surroundings neat and clean.
31. Society should respect the rights of fat people.
32. It's hard not to stare at fat people because they are so unattractive.
33. If I owned a business, I would not hire fat people because of the way they look.
34. I'd feel self-conscious being seen in public with a fat person.
35. The idea that genetics causes people to be fat is just an excuse.
36. I would not want to continue in a romantic relationship if my partner became fat.
37. The existence of organizations to lobby for the rights of fat people in our society is a good idea.
38. I don't understand how someone could be sexually attracted to a fat person.

39. If fat people knew how bad they looked, they would lose weight.
40. People who are fat have as much physical coordination as anyone.
41. Fat people are unclean.
42. Fat people should be encouraged to accept themselves the way they are.
43. Most fat people with latch onto almost any excuse for being fat.
44. It's hard to take fat people seriously.
45. Fat people do not necessarily eat more than other people.
46. Fat people obviously have a character flaw, otherwise they wouldn't become fat.
47. It makes me angry to hear anybody say insulting things about people because they are fat.

## APPENDIX H

### HEALTH-FOCUSED ARTICLE

#### **Lighten up, dieters! Focus on health, not weight**

By Carrie Dennett

#### **On Nutrition**

We are frequently reminded that we are experiencing an obesity epidemic that threatens the nation's health, and the solution is to diet and exercise to lose weight. But what if that's a flawed way to look at both the alleged problem and its solution?

What if being preoccupied with a number on a scale actually gets in the way of better health?

Health at Every Size, or HAES, is a weight-neutral approach to health, said Linda Bacon, Ph.D., author of "Health at Every Size: The Surprising Truth About Your Weight."

"When we fear-monger about weight, and tell people they need to change their weight, that's not going to help them be able to connect better with their bodies and make good choices to support them if they're feeling bad about themselves," Bacon said. HAES takes the emphasis off weight and puts it directly onto people owning and respecting their own bodies.

"Can there be a link between weight and health? Yes. Do we have a safe, reliable method of weight loss? No," said Lucy Aphramor, a Ph.D. dietitian and co-author with Bacon of the upcoming book "Body Respect." In fact, the most consistent outcome of dieting behavior is weight gain, she said.

Today, diets are often rebranded as lifestyle changes, but they are still diets, Bacon said.

"I don't think that people fully understand the implications of what we're learning from

the research, that diets don't work. They just think, 'Well, if we change something, this will work.'”

Aphramor said that even when people accept that diets don't work for long-term weight loss, they still assume long-term weight loss will improve health.

“Where's the evidence? I haven't found it,” she said. “Regardless of whether diets lead to long-term weight loss, promoting diets promotes weight stigma, and that's a problem.”

HAES promotes acceptance and compassionate self-care to improve health and well-being. “Someone's much more able to take care of themselves when they feel valued and respected, and the current anti-obesity agenda doesn't do that,” Aphramor said. As we lighten up on our own food rules and pursuit of the perfect body, she added, we are less likely to be judgmental of other people's bodies and food choices.

Compassionate self-care includes eating based on hunger, satiety, nutritional needs and pleasure, as well as engaging in an enjoyable type and amount of physical activity. “It's a different thing than going for the burn or getting the right amount of vitamin C,”

Aphramor said.

One common misperception about HAES is that it maintains everybody is healthy in the bodies they have. “Some people are not at weights that are optimal for them,” Bacon said, “but we start from a place of supporting people in good health behaviors, as opposed to addressing the weight as problematic.”

This is important for people of all shapes, sizes and ages, but the idea is far from mainstream, as evidenced by the current trend of sending home BMI report cards with school children. Bacon said this pointed focus on weight will simply make kids feel worse about their bodies or judgmental of their classmates' bodies. “It also teaches thin

kids that their health behaviors don't matter because it's only weight that contributes to health. So it doesn't help anybody."

## **APPENDIX I**

### **WEIGHT-FOCUSED ARTICLE**

#### **A Label Calls Attention to Obesity**

By Jane E. Brody

Most people know that obesity can result in serious health problems, yet many of us continue to focus on its cosmetic consequences rather than its risks to health. This distorted view may change now that the American Medical Association has finally labeled obesity a disease, not just a risk factor for other disorders. Last month, the organization recognized that obesity is a verifiable illness that warrants far more attention than physicians, patients and insurers currently give it.

The designation may change how aggressively doctors treat obesity, foster the development of new therapies, and lead to better coverage by insurers. After all, the price of not treating obesity is now in the stratosphere. Obesity-related health conditions cost the nation more than \$150 billion and result in an estimated 300,000 premature deaths each year. If the population's weight gain is not soon capped (or better yet, reversed), experts predict that half of adults in America will be obese by 2040. The A.M.A. has said in effect that it is medicine's responsibility to provide the knowledge and tools needed to curb this runaway epidemic.

On June 19, James Gandolfini, the hefty award-winning actor who portrayed Tony Soprano in "The Sopranos," died at 51, apparently of a heart attack, while on vacation in Italy. Even if genetics played a role, Mr. Gandolfini's weight contributed significantly to his risk of sudden cardiac death. Not a week earlier, a 46-year-old member of my family who weighed over 300 pounds died suddenly of what might have been a heart attack

while dozing in front of the television. He had long suffered from sleep apnea (a risk factor for sudden death), high blood pressure and severe gout, all results of his extreme weight.

Fran Saunders, a 62-year-old Brooklynite, is determined to avoid a similar fate. At 4 feet 11 inches tall and 157 pounds, she was clinically obese. She was sent for blood tests when she complained of a vision problem that could have been related to her weight. All her lab readings — total cholesterol, triglycerides, blood sugar — were seriously abnormal. Her doctor said she was a heart attack waiting to happen. But “the bad news was a blessing in disguise,” she told me.

Though she had long been a regular at the gym, she knew it was time to get her diet on a healthier track to lower her cholesterol, her risk of developing diabetes and her chances of dying prematurely. She now monitors what she eats and how much she exercises with a free cellphone app, My Fitness Pal. Gradual weight loss started almost overnight at a pound or two a week. Although her goal weight is 110 to 115 pounds, her blood test results improved significantly after she lost just seven pounds. “My doctor told me that every pound I lose lowers my risk,” said Ms. Saunders. “I know it’s possible for some people to be fit and fat, but that wasn’t the case for me, and it was time to stop kidding myself.”

The list of problems obesity can cause should be a call to action for the one-third of American adults who are obese.

**Heart Disease and Stroke.** Obesity can raise levels of artery-damaging triglycerides and LDL cholesterol, and lower levels of protective HDL cholesterol. This raises the risk of atherosclerosis tenfold by fostering a buildup of plaque in arteries that feed the heart and

brain. The chest pains of angina occur when the heart cannot get enough oxygen-rich blood through plaque-clogged arteries. A piece of plaque can break off at any time and block a narrowed artery, causing a heart attack or stroke. Obesity also strains the heart and can lead to heart failure — a heart unable to pump the blood necessary to supply the body with adequate oxygen and nutrients.

**High Blood Pressure.** Excess body fat increases the volume of blood the heart must pump to supply all tissues with nutrients and oxygen. This increases the pressure on artery walls, which contributes to heart disease, stroke and kidney failure.

**Type 2 Diabetes.** Obesity impairs the body's ability to use insulin to maintain normal blood sugar levels. Diabetes, in turn, is a leading cause of heart disease, stroke, kidney disease and blindness. Once a late-in-life disease, Type 2 diabetes now is often seen in overweight children. Even being moderately overweight can lead to insulin resistance, in which the body becomes insensitive to the hormone. The condition can be reversed by weight loss.

**Joint Disease.** The more weight a person carries, the greater the stress on joints and the risk of developing painful, incapacitating osteoarthritis in the knees, hips and lower back. Obesity is a major reason for the sharp rise in costly joint replacements. Excess weight can also cause premature failure of an artificial joint.

**Breathing Problems.** In addition to causing shortness of breath during physical exertion, obesity is the leading cause of obstructive sleep apnea — breathing stops periodically during sleep, followed by an abrupt intake of air and loud snoring. Apnea disrupts sleep and results in daytime drowsiness that can cause accidents.

**Cancer.** People who are obese are at increased risk of developing cancers of the colon, breast, endometrium, esophagus, pancreas, kidney, thyroid and gallbladder. One possible reason: increased amounts of growth factor in obese people may promote tumor development.

**Metabolic Syndrome.** One-third of overweight and obese people have a constellation of six factors that seriously raise the risk of cardiovascular disease: abdominal obesity, high blood pressure, high cholesterol, insulin resistance, excessive clotting factors and inflammatory compounds in the bloodstream. Abdominal fat is especially hazardous because it is metabolically active, unlike relatively inert fat on the hips and thighs. The list of obesity's hazards goes on: infertility in women, pregnancy problems, gallstones and gout, not to mention emotional disorders, social ostracism and employment discrimination. The first step toward avoiding all of these is a simple calculation to determine whether you are at risk. The most frequently used measure is body mass index, calculated by dividing weight in kilograms by height in meters squared. The National Heart, Lung and Blood Institute, among others, offers a free calculator online. In general, a B.M.I. of 30 or more indicates obesity, but B.M.I. can be misleading if heavy bones and big muscles account for a large portion of someone's weight. A simpler measure is a waistline as large as or larger than a person's hips. Overweight typically starts at a waist of 40 inches for men and 35 inches for women. The easiest assessment of all? Stand naked in front of a mirror and honestly assess the contribution that fat is making to your body's composition. It's not hard to see.

## APPENDIX J

### CONTROL ARTICLE

#### Debate on Climate Change Should be Over

By Seattle Times Editorial Board

Why is acknowledging humankind's role in climate change so hard?

THE state Senate this week had a brief but telling debate about climate change. It ended, depressingly, with a mostly party-line vote that very well could have taken place years earlier, with Republicans resisting the science on humankind's clear role in reshaping our global climate.

At issue was an amendment proposed by state Sen. Cyrus Habib, D-Kirkland, to a worthwhile energy policy bill that simply added the international scientific consensus: "The Legislature finds that climate change is real and that human activity significantly contributes to climate change."

State Sen. Doug Ericksen, the sponsor of the underlying bill and the oil industry's prime champion in the Senate, stood and asked lawmakers to substitute "significantly contributes" with "may contribute," suggesting that the science behind humankind's role in climate change is uncertain. "If you want to keep throwing up studies, we can keep knocking them down with other studies," said Ericksen, R-Ferndale.

That retrograde summary of climate change research is wrong and corrosive. The most comprehensive summary of climate-change research is compiled by the Intergovernmental Panel on Climate Change, a United Nations-affiliated task force of more than 3,500 experts. In its fifth report since 1988, the task force concluded that the effects of climate change — from dying coral reefs to more extreme weather patterns —

are already worse than predicted. It is “extremely likely” — at a 95 to 100 percent probability — that humans are the “dominant cause.”

Ericksen’s amendment passed because just one Democrat, state Sen. Brian Hatfield of Raymond, voted for it, while just one Republican in the GOP-led Senate, Sen. Steve Litzow of Mercer Island voted against it.

From the Puget Sound region, Republican Sens. Andy Hill of Redmond, Joe Fain of Auburn, Mark Miloscia of Federal Way, Pam Roach of Enumclaw, Steve O’Ban of University Place, Bruce Dammeier of Puyallup and Kirk Pearson of Monroe all voted for the amendment.

There certainly were partisan politics in play with this vote: a Democrat, Habib, seeking to amend a Republican’s bill in the GOP-led Senate. And Habib’s amendment didn’t meaningfully change Ericksen’s bill. But the vote was important, because it shows a refusal to publicly acknowledge the scientific consensus.

Acknowledging that consensus does not bind a lawmaker to specific solution to carbon emissions, such as Gov. Jay Inslee’s cap-and-trade proposal. There should be vigorous debate about the most effective way to ease Washington away from fossil fuels, limit our carbon emissions and move toward more renewable energy sources.

But getting to that debate must start with the simple acknowledgment: Since the Industrial Revolution, humans have been emitting carbon at unprecedented rates, and that is changing our climate.

## **APPENDIX K**

### **DEBRIEFING FORM**

We appreciate your participation in our study.

#### **Purpose of the Study:**

We previously informed you that the purpose of the study was to provide an opinion about a recent issue in the news. The goal of our research is to explore alternative ways to present health information that will increase knowledge but will not increase negative attitudes or prejudice toward individuals with higher weights. The findings of this study are likely to provide information on methods to improve the presentation of health information to promote health while reducing prejudice. To address this goal, three separate articles were used and one of these articles (“A Label Calls Attention to Obesity”) presented health information in a way that may have promoted prejudice against those with higher weights. This article was taken from an actual newspaper and it was chosen to represent a method of framing health behavior that has been shown to increase weight stigma. It does not represent the views held by the researcher or her research team.

#### **Information:**

While some individuals believe that “fat shaming” or negative beliefs about individuals with higher weights will lead to improved health behaviors, there is evidence of an opposite effect. Research indicates that experiencing weight stigma may cause increased binge eating or emotional eating, refusal to change one’s diet, and avoidance of exercise. This prejudice has also been associated with negative psychological effects including body image dissatisfaction, depression, and low self-esteem.

Following the study:

Please do not disclose research procedures or purposes to others who might participate in the study, as this could affect the results. All participants will be debriefed on the purpose of the study.

Contact Information:

If you have any questions or concerns regarding this study, its purposes or procedures, or if you have a research-related problem, please feel free to contact the researcher, Sylvia Herbozo, by email at [sherbozo@llu.edu](mailto:sherbozo@llu.edu).