THESIS

YOU'VE ONLY GOT YOUR LOOKS TO LOSE: THE EFFECTS OF MESSAGE FRAMING

AND INDIVIDUAL-LEVEL DIFFERENCES ON SELECTIVE EXPOSURE TO HEALTH

MESSAGES

Submitted by

Jesse N. Grace

Department of Journalism and Media Communication

In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Fall 2018

Master's Committee:

      Advisor: Marilee Long

      Ashley Anderson
      Dan Graham

ABSTRACT

YOU'VE ONLY GOT YOUR LOOKS TO LOSE: THE EFFECTS OF MESSAGE FRAMING

AND INDIVIDUAL-LEVEL DIFFERENCES ON SELECTIVE EXPOSURE TO HEALTH

MESSAGES

This study investigated how individual differences, such as exercise and healthy nutrition involvement, attitudes, and motivations, affect selective exposure to variously framed health messages. The study starts to bridge a gap in the social marketing literature, which mainly focuses on message effectiveness. Yet, it is not possible for a message to successfully promote healthy behavior change if it is not selected in the first place. The study utilized a split-plot, quasi-experimental design. The participants were shown four article headlines per topic; the two topics were healthy nutrition and exercise. For each topic, the article headlines were manipulated in a 2 (motivation frame: appearance vs. health) x 2 (strategy frame: gain vs. loss) within-subjects design. Selective exposure was measured unobtrusively by noting the order in which participants chose articles to read and the amount of time participants spent reading each article they chose. The results show individual differences influence message selection, therefore providing evidence for the importance of individual differences with regard to message framing. The study contributes to selective exposure, strategic communication, and health communication literature, as well as contributing to our knowledge of message tailoring for social marketing of healthy behavior changes and maintenance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1: Introduction

The U.S. obesity epidemic is a complex problem that requires a multifaceted solution. Strategic communication messages need to work in conjunction with other efforts to lower barriers to behavior change (e.g., providing safe places for people to exercise, improving accessibility to affordable healthy food) (Goldberg, 2000; Walls, Peeters, Proietto, & McNeil, 2011). Some programs have seen relative success in promoting behavior change, mostly at the community level. These successful campaigns tend to target a single behavior. For example, the "1% or less" media campaign worked in conjunction with the dairy industry in Wheeling, West Virginia, to successfully persuade people to switch to lower fat milk (Hornik & Kelly, 2007). The campaign used social marketing techniques in addition to making skim milk more palatable.

Yet, despite efforts, the prevalence of obesity has continued to increase in the United States; the latest data indicates that 37.9% of adults are obese (Centers for Disease Control and Prevention [CDC], 2015b). With the addition of people in the overweight category, the percent of the adult population with weight problems rises to 70.7 (CDC, 2015b). Being overweight or obese is associated with many health issues such as type 2 diabetes, heart disease, and high blood pressure, and it can lead to premature death (CDC, 2016). Obesity also cost the United States approximately $141 billion in health care costs in 2008, as well as between $3.38 and $6.38 billion in productivity costs due to obesity-related absenteeism (CDC, 2016). Strategic communications play a vital role in promoting healthy behavior changes, such as those needed encourage healthy weight loss to reduce the prevalence of obesity (Hornik & Kelly, 2007).

In strategic communication, reaching the target audience is key to the success of the message, and health messages are no different (Hornik, 2002). The internet has become a predominant source of health information, and search engines are the most common information

1

source utilized by millennials when seeking health and fitness information; 49% cite search engines as their most frequently used source of health and fitness information (American Press Institute, 2015).

Knowing where the audience is going for information is the first step in getting a message to the target audience. The next step is figuring out how to write the message so that the audience will attend to it. Often, researchers study how best to frame a message to encourage target audiences to attend to the message and be persuaded by it. For example, researchers have looked at message framing in terms of gain- vs. loss-strategy message frames (e.g., Gallagher & Updegraff, 2010; O'Keefe & Jensen, 2007). This work is relevant to messages related to obesity reduction, and it is one aspect of the current study.

Another approach to obesity-reduction messages is framing these messages from a motivation standpoint. For example, messages could be framed from a health- vs. appearance-motivation standpoint. According to theories of objectification, society places a heavy emphasis on appearance, particularly through the promotion of the thin ideal for women (Calogero, 2011; Frederickson & Roberts, 1997). Messages that combine societal appearance concerns with specific health behavior changes (Veerman et al., 2007) have the potential to get people's attention. Therefore, message framing in terms of motivation is a part of the current study.

To my knowledge, there are no studies that have investigated selective exposure to gain- vs. loss-strategy frames; the same can be said for studies of selective exposure to health- vs. appearance-motivation frames. In modern society, message choices are abundant, from health articles in magazines to information on the internet. It is becoming harder for messages to break through the clutter and reach the target audience (Hornik & Kelly, 2007). Selective exposure can explain why people choose to seek out and pay more attention to certain messages over others.

Specifically, people seek information that aligns with their pre-existing behaviors and beliefs, and avoid messages that challenge these beliefs (Festinger, 1957).

The main research question that this study investigated is the following: How do different message frames and individual-level differences affect selective exposure to health messages? Relevant literature has established the importance of the effect of individual differences on selective exposure to different message frames (Knobloch-Westerwick, Johnson, & Westerwick, 2013). In this study, I investigated individual-level exercise and nutrition behaviors, attitudes, and motivations. The message topics were exercise and nutrition, and the frames that were investigated were appearance- vs. health-motivation frames, and gain- vs. loss-strategy frames.

Chapter 2: Literature Review

The Importance of Social Marketing and Message Tailoring

Social marketing is a marketing approach that focuses on the promotion of behavior change to improve people's quality of life (e.g., improve health) and to persuade people to make positive contributions to society (e.g., protect the environment) (Lee & Kotler, 2011). Promoting healthy eating behaviors and exercise falls within its scope. While the goal of commercial marketing is to sell goods and services, social marketing aims to "successfully influence desired behaviors" (Lee & Kotler, 2011, p. 8). The primary beneficiary of social marketing is society, and the competition is the target audience's current behavior. Similar marketing strategies are used in both commercial and social marketing, e.g., segmentation of audiences to provide more relevant information in the messages distributed to publics (Lee & Kotler, 2011).

With regard to adapting messages to be more relevant to the audience segments, there are two approaches: targeting and tailoring. In brief, targeting is catering messages to a subset of the population who presumably have shared characteristics, whereas tailoring is catering messages to individuals based on their unique characteristics, (Kreuter & Wray, 2003). Targeting is more group level and tailoring is more individual level. Both techniques use the same strategy of using characteristics of the target audience to cater messages to them (Kreuter & Wray, 2003, p. S228). The current study has the potential to inform both tailoring and targeting strategies.

Literature that explores various strategies to combat obesity often refers to the successes of previous health campaigns such as anti-smoking campaigns. To name a successful campaign, the California Anti-Tobacco campaign was successful at utilizing mass media, in combination with increased cigarette taxes, to reduce smoking (Hu, Sung, & Keeler, 1995). However, campaigns aimed at promoting healthy weight loss through changes in lifestyle choices to reduce

4

obesity are more complex, as there is no single recommendation that is most effective at accomplishing the campaign's goal. For example, in the aforementioned Anti-Tobacco campaign, the single recommendation was to stop smoking. In comparison, there are various ways to promote weight loss through targeting specific lifestyle choices, such as reducing soda consumption, or promoting larger lifestyle changes, such as balancing calorie consumption and expenditure (Hornik & Kelly, 2007). The most agreed upon method to combat individual cases of obesity is through lifestyle changes, specifically lowering calorie consumption and increasing physical activity. There are also community factors that come into play, such as the availability and affordability of healthy food and safe places to exercise (Goldberg, 2000).

Framing

Strategic communicators in the business of social marketing have to consider how they should present a message so that it will be effective in promoting behavior change. A single issue could be presented in multiple ways. This is called framing. Framing refers to how certain aspects of messages are presented as more salient than others (Entman, 1993; Scheufele, 1999). These salient aspects of the message are the more memorable and meaningful aspects. Making a piece of a message more salient can be done through the use of repetition and the placement of information within the message (Entman, 1993). Yet, how a particular message frame is interpreted can vary among individuals depending on their pre-existing mental frameworks that guide their processing of the message. These mental frameworks or mental groupings of information are known as schemata (Graber, 1988). So the perception of a message frame depends on the interaction between the message and the message receiver (Entman 1993, Graber, 1988).

According to Entman (1993), frames have four functions: define problems, diagnose causes, make moral judgments, and suggest remedies. While a message may perform some of these functions, it may also perform none. Entman (1993) also notes that frames are in four places in the communication process: communicators, text (or messages), receivers, and culture. The communicators create the frames that exist in the message, which are then interpreted by the receiver. The meaning and understanding of the frames is often within the context of the culture.

Gain- vs. loss-strategy framing. The message frame is different from the content. Two stories can have the same content yet be framed differently. In health communication, framing is often looked at in terms of gains and losses (e.g., Gallagher & Updegraff, 2011; O'Keefe & Jensen, 2007). The idea of gain- vs. loss-strategy framing draws upon prospect theory (Kahneman & Tversky, 1979) where perceived gains from a behavior are evaluated differently than perceived losses. While Kahneman and Tversky (1979) evaluated perceived risks of a situation in terms of monetary outcomes, their theory has also been applied to health contexts (Akl et al., 2011).

In the context of health communication, gain- versus loss-strategy framed messages are defined in terms of adherence or nonadherence to recommendations. For example, in Gallagher and Updegraff's (2011) experiment and O'Keefe and Jensen's (2007) meta-analysis, they defined a gain frame as a message that states what will result from adhering to the advice in the message, and a loss frame states what will result from non-adherence. Examples of gain-strategy framed messages are "Exercise will improve your appearance," as well as "Exercise will help you lose excess fat." Examples of loss-strategy framed messages include "If you don't exercise, you will not have a toned physique" and "Lack of exercise will lead to weight gain." While there are other definitions of gain- and loss-strategy framed messages (e.g., Wansink & Pope, 2015),

the aforementioned definition appears to align with the original literature (Kahneman & Tversky, 1979) and also appears to be more widely accepted (e.g., Akl et al., 2011; Gallagher & Updegraff, 2011; O'Keefe & Jensen, 2007; Schneider, 1995).

Gain- and loss-strategy frames can be further broken down into gain and non-loss frames under the gain frame umbrella (Akl et al., 2011), which is also described as attaining a desirable outcome or avoiding an undesirable one (O'Keefe & Jensen, 2007). The same applies to loss frames, except a loss frame can be a loss, non-gain, avoiding a desirable outcome, or attaining an undesirable outcome. Akl et al. (2011) created the following table to summarize the definitions.

Table 1

Akl et al.'s Gain vs. Loss Definitions

	Gain		Loss	
Type of message	Gain: attain a desirable outcome	Non-loss: not attain an undesirable outcome	Loss: attain an undesirable outcome	Non-gain: not attain a desirable outcome
Example	If you undergo screening for cancer, your survival will be prolonged	If you undergo screening for cancer, your survival won't be shortened	If you don't undergo screening for cancer, your survival will be shortened	If you don't undergo screening for cancer, your survival won't be prolonged.

Source: (Akl et al., 2011, p. 4).

The current study used gain- and loss-strategy frames. An example of a gain-framed headline is, "6 ways being active improves your appearance" and a loss-framed headline is, "6 ways being inactive worsens your appearance" (see Appendices M & N for stimuli headlines).

Whether gain- or loss-strategy framed messages are more effective in promoting health behavior change is largely inconclusive. Some prior studies have found that gain frames are more successful in prevention behaviors (e.g., exercise, healthy eating, sunscreen use, etc.) and loss frames are more successful for detection behaviors (e.g., mammograms, STD testing, etc.)

(Rothman & Salovey, 1997). However, in terms of encouraging physical activity (a prevention behavior), a meta-analysis found there was no significant difference between the two strategy frames in terms of persuasiveness (O'Keefe & Jensen, 2007). A review of gain- versus loss-strategy framing, mainly in reference to nutrition messages, also concluded that, in general, neither strategy frame is more effective (Wansink & Pope, 2015). However, when individual differences are taken into account, variations in the effectiveness of different frames become apparent (e.g., Gallagher and Updegraff, 2011; Wansink & Pope, 2015). The individual differences of interest to the current study include people's level of involvement, attitudes, and motivations. These are discussed in more detail in the following sections.

Level of Involvement

To my knowledge, there are no studies that look at the effects of individuals' exercise or healthy nutrition behaviors on their selective exposure to messages. Instead, researchers have investigated how exposure to different message frames influences future health behavior (e.g., Gallagher & Updegraff, 2011; Jones, Sinclair, & Courneya, 2003). As discussed in the previous section, studies that evaluate whether gain- or loss-strategy frame messages are more successful have produced inconsistent results in persuading people to exercise, before individual differences are taken into account (O'Keefe & Jensen, 2007). There is evidence to support that individuals' level of involvement impacts whether gain- versus loss-strategy frame messages will be more successful. (Nan, 2007; Rothman & Salovey, 1997; Wansink & Pope, 2015).

The extent of topic involvement is defined as the level of personal importance the topic holds for an individual (Petty & Cacioppo, 1979). For example, Nan (2007) found that when an individual has higher levels of involvement in the behavior, loss-strategy frame messages are

more effective; when an individual has low topic involvement, gain-strategy frame messages are more effective. However, Nan's study found that the differences only occur when the message has an undesirable end-state (non-loss and loss in Table 1). Consistent with Nan's (2007) study, Wansink and Pope's (2015) review of nutrition-related studies also supports the trend that loss-strategy frames are more effective for people who have high levels of involvement and gain-strategy frames are more effective for people who have low levels of involvement. The current study measured exercise frequency and healthy nutrition involvement to evaluate participants' level of involvement with the topic.

Attitudes Towards Health Behaviors

Studies have measured how various message framing approaches affect attitudes towards exercising (Gallagher & Updegraff, 2011; Jones et al., 2003; Rosen, 2000); however, to my knowledge, studies have not evaluated how pre-existing attitudes towards a health behavior affect the selection of or effectiveness of variously framed health messages about that behavior. A study done by Rosen (2000) appears to be the only study that has measured attitudes toward exercise before exposure to messages that promote exercise. Rosen found that people who had positive attitudes towards exercising processed the messages more than people who had neutral or mildly negative attitudes towards exercising.

Other researchers have also measured attitudes toward exercise. For example, Gallagher and Updegraff (2011) found that when messages successfully resulted in higher exercise frequency in the following week, they also resulted in more positive attitudes towards exercise. Jones, et al. (2003) measured attitudes in a similar way. However, counter to Gallagher and

Updegraff (2011), Jones and colleagues found that exposure to messages promoting exercise did not affect attitudes toward exercise.

The key points from this section are: individual-level attitudes towards the health behavior affect message processing (e.g., Rosen 2000), and most researchers investigate the effects of message exposure on attitudes (Gallagher & Updegraff, 2011), while I am looking at the reverse – the effects of attitudes towards the behavior on message selection.

Using Appearance- vs. Health-Motivation Frames to Encourage Behavior Change

There are a handful of studies that investigate the use of appearance vs. health motivations to promote health-related behavior change. The most theoretically relevant study looks at physical activity; Gallagher and Updegraff (2014) investigated how need for cognition moderates the relationship between exposure to variously framed exercise-promotion messages and actual exercise behaviors that followed. Based on individuals need for cognition, the researchers successfully determined which combination of message frames and extrinsic- vs. intrinsic motivations resulted in higher intention to exercise. These results would be very valuable in message tailoring to specific individuals based on their characteristics. The study was an experiment that exposed people to gain- vs. loss-strategy framed messages in a 2x2 factorial design, but instead of studying appearance- vs. health-motivation frames, the researchers investigated intrinsic vs. extrinsic motivations for exercise. Intrinsic motivations provide "no obvious external incentives" (Gallagher & Updegraff, 2014, p. 821). Examples of intrinsic motivations are "personal satisfaction" and the "challenge or enjoyment that physical activity may offer" (Gallagher & Updegraff, 2014, p. 821). Extrinsic motivations are the opposite of intrinsic motivations in that they are not related to internal rewards such as personal satisfaction

and enjoyment. Examples for extrinsic motivations would be improving appearance, doing something to please others, and achieving physical health.

The current study is specifically investigating selective exposure to appearance- vs. health-motivation frames, as opposed to Gallagher and Updegraff's (2014) study that looked at intrinsic- vs. extrinsic-motivation frames. Both the appearance- and health-motivation frames in the current study use extrinsic motivators (see Appendix M & N for stimuli headlines). Examples of the extrinsic motivators used in Gallagher and Updegraff's study are the freshman 15, body definition, and muscle tone, which are very similar to the motivators in the current study. Gallagher and Updegraff found that gain-framed, extrinsic-motivated messages were significantly more effective at promoting physical activity than loss-framed messages for people with low need for cognition, but there was no significant difference in message effectiveness for people with high need for cognition. The current study did not measure need for cognition; however, based off of the aforementioned study's results, it appears more plausible that the gain-framed messages would be attended to more than the loss-framed messages.

For health communication in general, a prime example of an investigation that evaluates the use of appearance vs. health motivations to encourage behavior change is the promotion of sun protection (Morris, Cooper, Goldenberg, Arndt, & Gibbons, 2014). Morris et al. (2014) conducted a study that used messages that emphasized mortality risks from sun exposure in combination with photos of the participants' faces to encourage the use of sunscreen. The participants were all college-age women. In one condition of the study, they showed women a UV photo of their face and framed the photo as showing health consequences of sun damage. In another condition, participants were shown the same photo of themselves, but it was framed as showing the appearance consequences of sun damage. Morris et al. (2014) found that the

11

reminders of mortality were more effective in increasing sunscreen use intentions for the participants who were assigned to the appearance-framed UV photo condition compared to those who were assigned to the health-framed UV photo condition and those who were shown no photo at all. The success in using appearance to encourage behavior change may be attributed to the importance society places on appearance.

Objectification. Objectification theory is relevant as it explains why appearance-motivation frames may be more successful than health-motivation frames. Objectification is the emphasis and importance placed on appearance-based attributes over non-appearance based attributes; this occurs in the media and in society (Frederickson & Roberts, 1997). Self-objectification occurs when people place more importance on their appearance-based attributes (e.g., thinness and muscle-tone) than on their non-appearance based physical attributes (e.g., physical fitness) (Calogero, Tantleff-Dunn, & Thompson, 2011; Noll & Frederickson, 1998). The promotion of the thin ideal for women is a form of objectification that permeates the media, even in outlets that claim to promote physical fitness (Conlin & Bissell, 2014; Simpson & Mazzeo, 2016). The more people compare themselves to media messages containing idealized body images, the more likely they are to be dissatisfied with their own body and have a strong drive to be thin, as well as to engage in more disordered eating behaviors (Dittmar & Howard, 2004).

While objectification has been considered to be a predominantly female issue (Calogero et al., 2011), men also experience the effects of objectification (e.g., Olivardia, Pope, Borowiecki, & Cohane, 2004; Schwartz, Grammas, Sutherland, Stiffer, & Bush-King, 2011) There are differences in how men and women experience objectification due to societal norms, expectations, and standards of beauty: women feel pressure to be thin (Calogero et al., 2011;

Simpson & Mazzeo, 2016), whereas men feel pressure to be muscular (Morry & Staska;

Schwartz et al., 2011). Women also internalize beauty ideals more than men (Calogero et al.,

2011). The common theme with both men and women is that society places an importance on

appearance for both genders (Frederickson & Roberts, 1997; Morry & Staska, 2001). While

objectification can have harmful effects (body dissatisfaction, eating disorders, depression, etc.)

(e.g., Olivardia et al., 2014; Noll & Frederickson, 1998), using men's and women's natural

appearance concerns to encourage healthy behaviors has the potential to be beneficial if guilt can

be minimized (Hurst et al., 2011) (see Motivations for Exercising and Healthy Eating Behaviors

section for additional discussion on the role of guilt).

     Selective exposure and self-objectification. Objectification theory and its recent

applications in research evaluate exposure to the media (e.g., Slater & Tiggemann, 2016), such

as exposure to certain television shows, magazines, or Facebook. However, there is minimal

research on how women selectively expose themselves to objectifying content. One study that

evaluated this relationship specifically found that women with high levels of self-objectification

actually avoided objectifying content (Aubrey, 2006). This result aligns with cognitive

dissonance theory and theories of selective exposure (Festinger, 1957; Zillmann & Bryant,

1985), as exposure to objectifying content that results in body dissatisfaction would be an

unpleasant experience, one that would likely be avoided (Aubrey, 2006). However, in Aubrey's

(2006) study, exposure to objectifying content was self-reported; respondents reported the

popular television shows and magazines they consumed habitually, and coders rated how

objectifying the content of the shows and magazines was. In relation to the current study,

according to the definition of self-objectification, people who exercise more for appearance

reasons than for health reasons are self-objectifying. Even though appearance framed messages

can be objectifying which is has been identified an issue in some objectification research, if the messages present the ideal as attainable, they can actually have inspiring effects (Knobloch-Westerwick & Crane, 2012). Also, another study that will be discussed in the following section found guilt as the key problematic variable when self-objectifying in the form of exercising for appearance reasons, as opposed to using appearance alone as a motivator.

Motivations for Exercise and Healthy Eating Behaviors

Murray-Johnson and Witte (2003) point out the importance of motivations with regard to processing of health messages. Specifically, "motivation is central to how a message is processed and whether or not action is taken" (Murray-Johnson & Witte, 2003, p. 477). Therefore health messages that promote behavior change need to factor in these variables.

Some research suggests that using appearance to encourage weight loss or exercise can result in negative consequences. For example, Tiggemann and Williamson (2000) found that women who exercise for appearance reasons have poorer body satisfaction than women who do not. Body dissatisfaction is related to anxiety and depression (Calogero et al., 2011). On the other hand, Hurst, Dittmar, Banerjee, & Bond (2017) found evidence suggesting that when motivating women to exercise for appearance reasons, the use of appearance motivation is not the main cause of body anxiety. Their study investigated the relationship between exposure to messages that promote exercise through appearance goals, and guilt and body image issues. They found that guilt is a key variable, as when women experience guilt associated with exercising for appearance reasons, they experience higher levels of body anxiety. Most notably, they found that when messages used appearance to promote exercise, the messages did not cause body-image issues, as long as the message did not encourage guilt (Hurst et al., 2017, p.127). The results of

this study suggest that appearance-framed messages aimed at promoting exercise that do not use guilt as a motivation may promote exercise while not increasing or creating body anxiety.

Before a person can process a message, the message has to be selected first. This is no easy to task considering the number of messages people have to choose from on the internet alone. This is where selective exposure comes in to explain why people choose certain messages over others.

Selective Exposure, Cognitive Dissonance, and Confirmation Bias

Selective exposure is any systematic bias a person engages in when selecting information to attend to (Knobloch-Westerwick, 2014). Selective exposure is rooted in cognitive dissonance theory, where cognitive dissonance is a defensive bias that leads people to avoid information that challenges them, and to favor information that supports and confirms their pre-existing beliefs and/or behaviors (Festinger, 1957).

The term confirmation bias is often used in conjunction with, and sometimes even synonymously with, selective exposure (Brannon, Tagler, & Eagly, 2006). Both selective exposure and confirmation bias refer to how people seek information that aligns with their current beliefs and behaviors (Festinger, 1957; Jonas, Shulz-Hardt, Frey & Thelan, 2001; Sears & Freedman, 1967; Wason, 1968). Jonas et al. (2001) note how the term selective exposure can be misleading when referring to information seeking that aligns with a person's current beliefs, as selective exposure can also encompass the seeking of dissonant information. Jonas et al. (2011) use the term confirmation bias to refer to a person's preference for seeking supporting information. While the current study makes some predictions based on seeking attitudinally consistent information (see Hypotheses and Research Questions section), the study evaluates

message selection in general, and therefore predominantly uses the term selective exposure. Confirmation bias encompasses both how people seek and process information; people perceive information as confirming their current beliefs, which leads to the maintenance and strengthening of these beliefs (Johnston, 1996; Pinkley, Griffith, & Norhcraft, 1995; Schweiger, Oeberst, & Cress, 2014). The current study does not focus on how people process and perceive information, but rather how their individual differences predict message selection.

Selective exposure, cognitive dissonance, and confirmation bias are often studied as they pertain to political ideology, especially around election time (e.g., Bachl, 2017; Knobloch-Westerwick, Johnson, & Westerwick 2015; Wicks, Wicks, & Morimoto, 2014). Often, these studies use surveys to measure selective exposure where participants self-report the content they attended to. For example, in a 2017 study conducted by Bachl, selective exposure was measured by asking respondents, "which media outlets he or she used for political information during the past seven days" (p.355). Political attitudes and perceived media bias were also measured. Perceived media bias was measured by asking the respondents to name up to three political parties (the study was conducted in Germany) that they thought the news outlets they attended to favored. Wicks et al. (2014) measured selective exposure in a similar way by listing 30 outlets and asking the respondents to specify which ones they used to get information about the presidential election. They also measured political orientation, and political and civil engagement.

There is a fundamental issue with using self-report to measure selective exposure. An assumption of the selective exposure paradigm is that people are often not aware of their own media selection process (e.g., Zillmann, 1985). If people are unaware of their selection process when selecting content, they cannot provide valid data about their selection habits. There are also

social desirability issues as people may try to present themselves in a more favorable way than in reality (Knobloch-Westerwick. 2015). An example of this is news consumption, which is a habit that is thought to be desirable, and so people over-report the amount of news they consume (Knobloch-Westerwick, 2015; Prior, 2009). Therefore, self-report is not a sufficiently reliable method for measuring selective exposure (Knobloch-Westerwick, 2015).

There appear to be few studies that have used non-self-report measures of selective exposure; however, two have used non-self-report measures *and* have studied selective exposure to health information, specifically on the Internet (Knobloch-Westerwick, Johnson, & Westerwick, 2013; Knobloch-Westerwick & Sarge, 2015). Knobloch-Westerwick et al. (2013) looked specifically at how individuals self-regulate their health behaviors through their message selection. They measured selective exposure unobtrusively by capturing which article headlines the participants chose to click on and how long they spent reading the linked article. They found that participants who were living up to their self-standards on a specific health behavior selected articles in line with their health behaviors. For example, if participants drank a lot of coffee, and their self-standard was to drink a lot of coffee, they would choose a message that highlighted the positive effects of coffee as opposed to the negative effects. This supports cognitive dissonance theory. However, the same study also found that participants who fell short of their self-standards for a certain behavior selected messages in line with their self-standards as opposed to their actual behavior. For example, if a woman thought she drank too much coffee, she would likely selectively expose herself to messages that highlighted the negative effects of drinking coffee. This shows that while people may not always seek out information in line with their behavior, their information-seeking patterns are still predictable, as they will still seek out information in line with their ideal selves.

Knobloch-Westerwick and Sarge (2015) looked at selective exposure specifically in reference to weight-loss information. They investigated the effects of including efficacy information in the form of exemplification in the messages. In the exemplification messages, there was a named example of a person who was trying to lose weight. In the high-efficacy message this person was successful, and in the low-efficacy message this person was not. The Knobloch-Westerwick and Sarge (2015) study design differed from the aforementioned Knobloch-Westerwick et al. (2013) design as messages were randomly assigned to participants and for the selective exposure measure, the participants had the option to read more after viewing the article lead. Knobloch-Westerwick and Sarge (2015) found that assignment to the exemplification message conditions led to higher exposure time, as well as increased engagement in the recommended health behavior two weeks later; [r1] the relationship was moderated by exposure time.

The current study used a similar method to Knobloch-Westerwick et al. (2013) to unobtrusively measure selective exposure to internet messages. Considering the vast number of health messages on the internet, social media, and even different marketing campaigns, a message would first have to be seen and selected for reading before it could even attempt to result in behavior change. Therefore, selective exposure is an important step to consider when message producers are trying to reach a target audience with a message.

Hypotheses and Research Questions

According to theories of cognitive dissonance, confirmation bias, and selective exposure, people seek and attend to information in line with their beliefs and behaviors (Festinger, 1957; Knobloch-Westerwick, 2014). The following hypotheses and research questions follow from

18

these theories. For this study, selective exposure was measured in two ways: which article was selected first, and amount of time spent on articles that were selected.

H1a: The stronger the participants' health motivations, the more time they will spend on health-motivation framed articles.

H1b: The stronger the participants' appearance motivations, the more time they will spend on appearance-motivation framed articles.

RQ1: Which type of motivation-framed articles will participants who have both high health and high appearance motivations spend the most time on?

H2a: The stronger the participants' health motivations, the more likely they will be to select health-motivation framed articles first over appearance-motivation framed articles.

H2b: The stronger the participants' appearance motivations, the more likely they will be to select appearance-motivation framed articles first over health-motivation framed articles.

RQ2: Which type of motivation-framed articles will participants who have both high health and high appearance motivations select first?

Studies that have investigated the effectiveness of using gain- vs. loss-strategy frame messages to promote health behaviors have produced mixed results. For example, Rothman and

Salovey (1997) found that gain-framed messages are better suited for prevention behaviors such as healthy eating and exercise; consequently, gain-framed messages may be more effective in this study. On the other hand, a meta-analysis found that gain-framed messages were not significantly more persuasive than loss-framed messages with regard to physical activity (O'Keefe & Jensen, 2007). However, in the most theoretically relevant study to the current one, gain frames were again more successful in promoting exercise in participants who had low need for cognition (Gallagher & Updegraff, 2014). While there are mixed results, the literature appears to lean slightly more towards the use of gain frames in messages about prevention behaviors. As a result, the following hypothesis was proposed.

H3: Participants will spend more time on gain-strategy framed articles than on loss-strategy framed articles

Objectification theory explains how society places an emphasis on female appearance, more so than with male appearance. While both men and women experience the effects of objectification (e.g., Olivardia et al., 2014), women are more likely to internalize this ideal than are men (Calogero et al., 2011). Based on this information, the following hypotheses are posed.

H4a: Women will spend more time reading appearance-motivation framed articles than will men.

H4b: Women will be more likely to select appearance-motivation framed articles first than will men.

Gallagher and Updegraff's (2011) study found that past exercise behavior (in the week prior to the study) did not affect the relationship between message frames (gain vs. loss, extrinsic vs. intrinsic), need for cognition, and exercise outcomes. While the aforementioned study was the most relevant to this study, there also does not appear to be any indication in the other relevant literature on whether level of involvement in the behavior will affect selective exposure to health- vs. appearance-motivation framed messages. As a result, I have posed the following research questions.

RQ3a: Is there a relationship between level of health behavior involvement and time spent on appearance- vs. health-motivation framed articles?

RQ3b: Is there a relationship between level of health behavior involvement and likelihood of appearance- vs. health-motivation framed articles being selected first?

If a person engages in a behavior frequently, it seems logical that this would be synonymous with levels of involvement in the behavior. When an individual has higher levels of involvement in the behavior, loss-framed messages are more effective, according to the literature. When an individual has low subject involvement, gain-framed messages are more effective (Nan, 2007; Rothman & Salovey, 1997; Wansink & Pope, 2015). I am therefore posing the following hypotheses.

H5a: The higher a participant's health behavior involvement, the more time spent on loss-strategy framed articles.

H5b: The lower a participant's health behavior involvement, the more time spent on gain-strategy framed articles.

H5c: The higher a participant's health behavior involvement, the higher the likelihood that loss-strategy framed articles will be selected first over gain-strategy framed articles.

Previous researchers have measured the effects of messages on attitudes towards a behavior (Gallagher & Updegraff, 2011; Jones et al., 2003), but only one study measured attitudes prior to message exposure (Rosen, 2000). Individual attitudes affect message processing (e.g., Rosen, 2000), and attitudes can be affected by message exposure (Gallagher & Updegraff, 2011). Based on the literature that evaluates attitudes, message framing, and health behaviors, it is unclear how attitudes would affect article selection. I pose the following research questions to explore this relationship.

RQ4a: Is there a relationship between participants' attitudes towards a health behavior and time spent on appearance- vs. health-motivation framed articles?

RQ4b: Is there a relationship between participants' attitudes towards a health behavior and the likelihood of appearance- vs. health-motivation framed articles being selected first?

RQ4c: Is there a relationship between participants' attitudes towards a health behavior and time spent on gain- vs. loss-strategy framed articles?

R4Qd: Is there a relationship between participants' attitudes towards a health behavior

and the likelihood of gain- vs. loss-strategy framed articles being selected first?

Chapter 3: Methodology

Design

The current study utilized a split-plot quasi-experimental design. The design is based off of the method utilized to measure selective exposure established by Knobloch-Westerwick et al. (2013). Their study was on how self-regulation of general health behaviors manifests in selective exposure to health messages. The current study investigated how exercise and healthy nutrition level of involvement, attitudes, and motivations affect selective exposure to variously framed messages. These relationships were tested in the context of two weight loss related topics: exercise and healthy nutrition. These are both prevention behaviors, and therefore it was predicted that there would be no significant differences in the results across the two topics. The study was administered through Qualtrics, an online survey creation and distribution software, and it was distributed via email to the participants. Qualtrics has question timing capabilities, a lot of flexibility with question design and page display, and the ability to host experiments. The experiment was administered online, which allowed the participants to take part in the study on their own device at any time during the period that the study was available.

Advantages of administering the study online are the relatively low cost, the fact that it can be administered over a short period of time, and the results are available for analysis instantly (Wimmer & Dominick, 2014). Some disadvantages of experimental research are the artificiality and limited scope (Wimmer & Dominick, 2014). The current study minimizes artificiality as the participants took part in the study on their personal computer or mobile device at a time that was convenient to them; however, the compromise is that I relinquished control over the environment they took it in. The participants may have gotten distracted during the experiment. If a distraction occurred while the participants were reading an article, this would

inflate their reading times. However, since the selective exposure section of the experiment only required them to click on two articles, and they had the option to proceed when they were done reading, there is less chance of them getting distracted than if they were required to read all of the articles. There is also a possibility that participants were multitasking while participating in the experiment. To minimize this chance, I requested that the participants make sure that they have an adequate amount of time available to complete the study uninterrupted. Qualtrics also allowed for the collection of paradata, which enabled me to tell how long it took participants to complete the study.

Population and Sampling

Population. The population of interest for the study is college students. College students are an at-risk population for engaging in unhealthy weight-management practices such as fasting and purging (e.g., Harring, Montgomery, & Hardin, 2010; Lowry et al., 2000), especially women (e.g., Tylka & Sublich, 2002). It is also important to reach traditional-aged college students as this is a time where young people are in a transition phase from being taken care of by their parents into independence, especially with regard to food and health decisions, and is the time where young people start to form lifelong habits (Kelder, Perry, Klepp, & Lytle, 1994).

I sampled both men and women. While women are more likely than men to gain excess weight in their early years at college (Vadeboncoeur, Townsend, & Foster, 2015), men are also a population of interest because more college men are in the overweight category than are college women, yet more college women are trying to lose weight than college men (e.g., Harring et al., 2010; Wharton, Adams, & Hampl, 2008). This evidence supports theories that women are more susceptible to the thin ideal (Calogero, Tantleff-Dunn, & Thompson, 2011) and also have

inflated misconceptions about their body weight. Men on the other hand have deflated

misconceptions about their body weight: they think they are in a lower weight category than they

are (e.g., men think they are a healthy weight; however based on their BMI, they are

overweight). This is a health concern, as men who need to be engaging in weight-control

strategies are not because they do not think they are overweight (Harring et al., 2010). Therefore,

both college men and women were recruited for the study.

Sampling method. For this study, I used a convenience sample of Colorado State

University college students taking Journalism and Media Communication or Marketing classes

during the spring 2018 semester. This is a non-probability, convenience sample and cannot be

considered an accurate representation of the population of interest: the U.S. college student

population. Due to the limitations of the sampling method, it is not possible to make a population

inference based on the results of this study. However, it is possible to make a process inference

(Hayes, 2010, p. 41). A process inference means that if the data suggest a pattern or explain a

process, it is reasonable to say that the process may also be at work in similar situations, i.e., the

results are transferable.

Criteria. To be eligible to participate in the study, the participants had to be in college

and 18 or older.

Recruitment. Participants were recruited through classes in the Journalism and Media

Communication Department and the Department of Marketing Colorado State University.

Students in JTC 211, 300, 340, 365, 370 414, 417, and 460, and MKT 370 and 492 classes were

recruited. I attended one class for each course to explain the study and the extra credit

opportunity (see Appendices A-D for recruitment materials). I received permission from the

instructors for the aforementioned courses to recruit in their classes and to offer extra credit for

participation. The amount of extra credit was decided by each instructor. There were 380 students in all of the classes combined.

After I visited a class, the students received an invitation email followed by a reminder email, both of which contained a link to the experiment and were spaced over the data collection period: March 2nd through March 14th. The collection period was scheduled to end on March 9th, as stated in the recruitment materials, but it actually ended on March 14th as some JTC 300 sections needed an extension as they were offered the opportunity to participate in an unrelated study at the same as this one. As per IRB requirements, any students who did not wish to participate in research were offered an alternative assignment to receive extra credit, but no one requested to do so.

Instrumentation

Independent variables. The independent variables are exercise and healthy nutrition involvement, attitudes, motivations, and gender.

Level of involvement in the behavior. Level of involvement in exercise was determined by measuring participants' exercise frequency. The nutrition equivalent of exercise frequency is healthy nutrition involvement.

Exercise frequency. Exercise frequency is a measure of how physically active a person is. Exercise frequency is operationalized as the number of times a week that a participant engages in varying levels of physical activity. The measures are adapted from the International Physical Activity Questionnaire (IPAQ) (Booth, 2000). Six questions are asked that enable the computation of a total score. The questions ask how many times in an average, seven-day week the participant walks, engages in moderate exercise, and engages in strenuous exercise (See

Appendix E for exercise frequency questions). Based on the IPAQ scoring protocol (Blasio, Di Donato, & Mazzocco, 2016), the responses were weighted and summed together to produce a score. For each activity (walking, moderate activity, and strenuous activity), the number of days per week the participant engaged in that activity was multiplied by the amount of time spent on the activity per day. That number was then multiplied by 9 (for strenuous activity), 4 (for moderate activity), and 3.3 for walking. This procedure was followed for each activity that a participant reported, and then a sum across all activities was calculated.

There were also questions about whether the participants are competitive athletes, or were competitive athletes in the past (see Appendix E). This information aided in data cleaning, as some participants had excessively high scores. Some of these participants were competitive athletes, which explained their high scores, but others appear to have misunderstood the question and were adding the total amount of time they spent exercising during the week as opposed to the amount of time spent on an average day that they exercised. A total of 17 participants were removed from any analyses that used the exercise frequency variable as they had very high scores (exercising for more than three hours a day, multiple times per week), and they were not athletes.

Healthy nutrition involvement. Healthy nutrition involvement is the nutrition topic equivalent of exercise frequency. There appears to be no mutually agreed upon way to measure how healthy a person eats without asking them to complete a food journal, which was not practical for the current study as the main focus was selective exposure, and a food journal would dramatically increase the time required to participate in the study. Therefore, a healthy nutrition involvement scale was created using questions from studies that evaluated whether people are considering the nutritional value of food when making decisions on what to eat.

Essentially, these questions measure whether the participants are making an effort to eat healthy. The questions were selected from a study on healthy eating motivation and food choice (Naughton, McCarthy, & McCarthy, 2015), as well as the 2007 Health Survey for England (Chaudhury et al., 2008). The questions chosen measured whether participants consider nutritional value when making food choices (see Appendix F for healthy nutrition involvement questions). The questions were combined into a scale that is reliable (Cronbach's Alpha = .83).

Exercise attitudes. Exercise attitudes is operationalized as how positively or negatively a person feels about exercising regularly. Six items from a study by Gallagher and Updegraff (2011) were used to measure attitudes toward exercising. The participants were asked to rate each item on a 7-point Likert scale. (See Appendix G for exercise attitude questions). The six items were combined into a reliable scale (Cronbach's Alpha = .83).

Healthy nutrition attitudes. This is a measure of how positively or negatively a person feels about eating healthy food. The same six measures that were used for exercise attitudes were used to measure healthy nutrition attitudes, but the question stem was altered to reflect the topic. In addition, one item was added from the 2007 Health Survey for England (Chaudhury et al., 2008) (See Appendix H for healthy nutrition attitude questions). The measures also received satisfactory inter-item reliability and were combined into one scale (Cronbach's Alpha = .73).

Motivations for exercise. Motivations for exercise were evaluated in terms of health and appearance outcomes. Relevant items from the Exercise Motivations Inventory -2 (EMI-2) (Markland & Ingledew, 1997) and the Exercise Motives and Gains Inventory (EMGI) (Ingledew, Markland, & Strömmer, 2013) were used. I did not include the whole scale, only specific health and appearance motivations. The original scales ask participants to rate items on a 7-point scale ranging from "not at all true for me" to "very true for me," and do not label the scale's midpoint.

I opted to use a 6-point scale: very true for me, true for me, somewhat true for me, somewhat untrue for me, untrue for me, and very untrue for me. I decided to remove the midpoint due to the nature of motivation. It did not seem logical to include a neutral midpoint, as it would not make sense to be neutrally motivated. While the extent to which the specific motivation (e.g., exercising to stay slim) is a driving factor for the participant may vary, a person is either motivated by the reason or not.

The question stem included "personally I exercise (or might exercise)..." with five response items to complete the sentence. I selected a total of five appearance motivation items such as "to improve my appearance," "to stay slim," etc., and five health motivation items, such as "personally I exercise (or might exercise)..." "to avoid ill health," "to maintain good health," etc. (See Appendices I & J for health and appearance motivations for exercise). For exercise, the appearance motivation scale (Cronbach's Alpha = .884) and the health motivation scale (Cronbach's Alpha = .905) were both reliable. These two scales measured health motivations and appearance motivations separately; as a result, a person could be equally high (or low) on both appearance and health motivations.

I also measured health and appearance motivations using a forced-choice approach. Unlike the two motivation scales described in the previous paragraph, this measure required participants to decide whether appearance or health was their main motivation for exercising (or would be there main motivation them to exercise) (see Appendix K for appearance vs. health motivations for exercise). The scale was reliable (Cronbach's Alpha = .89). This measure created two additional motivations for exercise scores: a forced-choice appearance motivations score and a forced-choice health motivations score. On the appearance side of the scale (left), position 3 on the scale = a score of 1, position 2 = 2, position 1 = 3 (as position 1 is closest to the closest to the

appearance statement and the furthest from health). This was done for all three items to create the forced-choice appearance motivations score. The same thing was done with the health side of the scale (right), where position 4 on the scale = a score of 1, position 5 = 2, position 6 = 3 (as position 1 is closest to the closest to the health statement and the furthest from appearance). This was done with all three items to create the forced-choice health motivations score.

Motivations for healthy nutrition. The same scales that were used to measure motivations for exercise were used to measure nutrition motivations, but as with attitudes, the question stem was altered to reflect the healthy nutrition topic. The motivations for exercise item that asked about whether they exercise to "improve the appearance of my muscles" was changed to "improve my physique" for the healthy nutrition topic (see Appendices K & L for health and appearance motivations for healthy nutrition). For healthy nutrition, the appearance motivation scales (Cronbach's Alpha = .92) and health motivation scale (Cronbach's Alpha = .932) were both reliable.

The additional forced-choice health and appearance motivations scale that was used in the motivations for exercise measure was also used for healthy nutrition. The scale was reliable (Cronbach's Alpha = .93). This measure also created two additional motivations for healthy nutrition scores: a forced-choice appearance motivations score and a forced-choice health motivations score (see above Motivations for exercising section for explanation on how scores were calculated). The exercise and nutrition scores were combined for analysis.

Demographics. The demographic variables of interest are age, gender, race and ethnicity, weight and height (See Appendix Z for demographic questions).

Dependent variable.

Selective exposure. Selective exposure is any bias in messages selection. When people have multiple messages or content to choose from, they will decide which content to attend to. Selective exposure is operationalized in two ways: (1) which article is clicked on first; and (2) time spent, in seconds, on an article, which was measured from after the participant clicks on the headline and is taken to the main article until the participant leaves the article page. Qualtrics unobtrusively recorded this information. This measurement approach has been deemed a more appropriate way to measure selective exposure (Knobloch-Westerwick, 2014) compared to previous studies that have relied on participants to self-report health-message-seeking behavior (e.g., Weaver et al., 2010). Self-report can be problematic as one of the main assumptions of the selective exposure paradigm is, "media users are largely unaware of their message choice motivations," and, "message choices typically occur in a rather casual fashion and, as a result, are not fully accessible through later recall," (Knobloch-Westerwick et al., 2013, p. 810).

There were two open ended questions in addition to the selective exposure activity that asked participants why they chose the first story they did in each topic area (see Appendix Y for the open-ended questions). These questions are included to provide additional insight into the participants' motivations for selecting the articles, in addition to the individual differences that were measured. The responses were not used in the current study, but will be used in a secondary analysis.

Stimuli

Stimuli were manipulated in a 2x2 factorial within-subjects design (see Table 2), where all of the participants answered the questionnaire, and partook in the selective exposure activity, where they were exposed to the same content.

Table 2
Article Frames in Selective Exposure Activity

Strategy Frame

	Gain Frame	Loss Frame
Appearance Frame	Appearance Gain Article	Appearance Loss Article
Health Frame	Health Gain Article	Health Loss Article

(Motivation Frame)

There were two topic pages: exercise and nutrition. Each topic page had the four article titles displayed horizontally and the order randomized to avoid sequence effects. The layout mimics a suggested articles list on a website, which is usually underneath an article that a person is reading (e.g., livestrong.com, health.com, cosmopolitan.com, etc.).

The headlines displayed for each article were in the same format and of similar length (see Appendices M & N for stimuli page layout and article titles). When the respondents clicked on an article's headline, they were taken to a new page with the full article. This page had an embedded timer. All articles about the same topic (exercise or nutrition) were of comparable length and reading difficulty; all of the exercise articles were at eighth-grade reading level, and the nutrition articles were all sixth-grade reading level. Ensuring that the articles are of similar length and reading ability rules these factors out as alternative explanations for additional time spent on articles (See Appendices Q-X for full articles).

Procedure

When participants clicked on the link to the experiment in the email they received, they were taken to the informed consent document and had to click "agree" before being taken to the study. Following informed consent, participants answered two introductory questions on their interest in health and appearance. These questions were followed by the exercise measures: attitudes, motivations, and frequency. The nutrition measures followed: healthy nutrition involvement, motivations, and attitudes, in that order. The questions primed the participants to think about their own health behaviors before going into the selective exposure activity. Intentionally priming the participants mimics a realistic situation, as something would have prompted a person to search for the health information. Also, the relationships between variables should be most prominent when a respondent is in a primed situation.

The stimuli section followed the exercise and nutrition questions. Participants were randomly assigned to see either the four exercise article headlines or the four nutrition article headlines first. Within each article topic, article headline order was also randomized. Once participants completed the stimuli section for the first four articles, they completed the stimuli section for the second four articles.

On the first page of the stimuli section, instructions explained how to navigate through the articles and told the participants to, "Browse through the articles staying on each article for as long or short as you like, behaving as you would if you found them on a website." There was no time limit for how long the participants were allowed to stay on the activity (see Appendices M & N for first stimuli pages). There were two open-ended questions between the stimuli section and demographic section on why the participants chose the first articles they did for each topic. Then demographics were collected. Lastly, a message debriefed the participants on what the

study was about and provided links to resources with reliable health and weight-loss advice (see Appendix AA for debriefing statement).

Pilot Studies

I conducted a partial pilot study for the experiment in November last year (2017) as part of a class in survey design. The pilot study was a survey, and I only tested the exercise topic measures. Instead of the selective exposure stimuli section, the exercise article headlines, subheads, and source were shown, and a series of questions were asked to evaluate the likelihood of a respondent choosing to read the full article. The pilot was conducted using a convenience sample of 120 students from classes in the JMC Department. A total of 105 students took part in the survey.

The measures of attitude (Cronbach's Alpha = .83) towards exercise, and the health (Cronbach's Alpha = .91) and appearance (Cronbach's Alpha = .84) motivations to exercise were all found to be reliable in the pilot. However, all of the measures only had four or five scale points, which appeared to be causing a ceiling effect as there was a lot of clustering around the high end of the scales. Therefore, the main study used six- and seven-point scales to lessen the chances of a ceiling effect.

Results from the pilot also prompted a change in the exercise frequency measure. The pilot measured exercise using the Godin Leisure-Time Exercise Questionnaire (GLTEQ) (Godin & Shephard, 1985), which appeared to cause some participants to misunderstand what the questions were asking, as they were reporting very high exercise frequencies; the scores indicated that a large portion of the respondents claimed to exercise or walk for 4 or more hours per day, most days of the week. Based on the problem with the GLTEQ, I replaced it with the

IPAQ (see Methods section). The issue with the high scores on the exercise frequency measure also prompted the addition of a question about whether or not the participants were currently athletes, which provided justification for very high scores.

A second pilot was conducted in February and March of this year (2018). This pilot was the full version of the study and included both the healthy nutrition measures and the full stimuli section. This second pilot included a total of 26 friends and colleagues. The participants were asked to provide feedback on the study (e.g., if the questions were easy to understand and answer, if the instructions in the stimuli section were easy to follow, technical difficulties).

Based on the results of the second pilot, the only parts of the stimuli that were changed were the article headlines. The article headlines in the pilot included an exclamation point and used the word "exercise" as opposed to being active (e.g., "6 Ways Exercise Will Improve Your Health!"). The participants in the pilot found the exclamation point to be reminiscent of clickbait. Also, during the second pilot, a discussion with some of the participants identified an aversion some people have to the word exercise. After consulting with committee members, the exercise topic headlines were rewritten, and the words "exercise" and "not exercising" were replaced with "active" and "inactive." Some pilot participants were then asked their opinion on which wording they preferred, and they expressed that they were more open-minded towards, and therefore more inclined to read, an article that says "active" as opposed to "exercise." See Appendices O & P for the main study's article headlines.

Chapter 4: Results

A total of 272 people participated in the study. Two participants quit before they made it to the stimuli section and were therefore removed from the study. Three more people were removed for not taking the study seriously, which was determined by both time spent on the survey (less than 6 minutes, as everyone who took less than 6 minutes also exhibited other signs of satisficing, e.g., answered in an obvious visual pattern, and/or only spent a total of 1-4 seconds reading the stimuli section instructions and selecting an article) and question response being in an obvious visual pattern, e.g., answering all down one side or in a diagonal line.

The age range of respondents was 19 to 41 years, with a mean age of 22.15 and a median age of 22. There were 126 males, which made up 47.2% of the participants and 138 females, which made up 51.7%; one person chose not to respond to the gender question. The participants were 76.4% white, 9% Hispanic, 5.6% of mixed descent (selected multiple options), 4.1% Asian, 2.6% black/African American, 1% "other," and .04% Native American or Alaskan. One person chose not to respond to the race and ethnicity question. See Table 3 below for descriptive statistics on the other variables.

Table 3

Descriptive Statistics for the Variables Used in Analyses

Variable	Range	Mean	SD
Exercise frequency score	0-163.48	39.04	31.69
Healthy nutrition involvement	2-6	4.02	.79
Attitudes *	1.75-7	5.7	.74
Appearance motivations*	1-6	4.41	.92
Female Appearance Motivations	1-6	4.63	.94
Male Appearance Motivations	1.59-6	4.19	.94
Health motivations*	1-6	4.89	.77
Female Health Motivations	1-6	5.01	.74
Male Health Motivations	1.48-6	4.77	.79
Appearance (1) vs. health (6) motivations*	1-6	3.98	1.32
Female Appearance (1) vs. health (6) motivations*	1-6	3.87	1.35
Male Appearance (1) vs. health (6) motivations*	1-6	4.11	1.29
Time spent on appearance articles in seconds*	1.59-325.37	40.93	49.78
Time spent on health articles in seconds*	1.98-722.99	42.39	73.48
Time on spent gain articles in seconds*	2.16-559.72	48.40	74.93
Time spent on loss articles in seconds*	1.91-496.69	32.39	56.76

* Exercise and nutrition topics combined

Before running hypothesis testing, an order effect needed to be ruled out because there

was concern that a significant amount of the variance could be explained by participants

selecting the article displayed on the far left (the first article in the list) first. For both topics, one-

sample chi-square tests were used to test for an order effect. For the exercise topic, there was not a statistically significant difference between the expected *n* and the observed *n* (x^2 (1) = .101, *p* = .750). The nutrition topic also did not produce a significant difference (x^2 (1) = 1.200, *p* = .273). Therefore, order does not explain the results; the participants did not select the first story significantly more frequently than the other stories.

Literature suggested that there should not be a difference across topics as both exercise and nutrition are prevention health behaviors; therefore, I wanted to combine the topics for analysis; this allows greater generalizability to other health prevention behaviors and allows for discussion of the phenomena in general, as the results are not topic specific. However, it was necessary to test whether the topics could be combined before doing so. A paired samples t-test was used to determine whether there was a significant difference between time spent on the same framed articles across topics. There were no significant differences across topics for any of the article types (See Table 4 below).

Table 4

Paired Samples T-Test Results for Time in Seconds Spent on Exercise and Healthy Nutrition Articles

Article Frame	E* M	N* M	E* SD	N* SD	T-test	*p*
Health gain	25.92	28.98	41.26	40.21	*t*(95) = -.766	.446
Appearance gain	28.47	35.01	31.39	42.30	*t*(59) = -1.220	.227
Health loss	12.58	17.70	12.20	27.58	*t*(16) = -.686	.502
Appearance loss	30.63	28.88	38.28	27.76	*t*(11) = .274	.789

*E = Exercise topic and N = Nutrition topic.

As there were no significant differences across topics, I combined the topics for all of the hypotheses, except for those that included measures of behavior involvement, as these measurements were on different scales (exercise was continuous and nutrition was bounded).

Hypotheses Testing

Hypothesis 1a states: The stronger the participants' health motivations, the more time they will spend on health-motivation framed articles. Because the time variable was not normally distributed, a Spearman's Rho correlation was utilized (time spent on health articles: skewness of 5.076, kurtosis of 36.831). The hypothesis was not supported. There was no significant relationship between health motivations and time spent on health-motivation framed articles, $r_s(212) = .124$, $p = .071$.

Hypothesis 1b states: The stronger the participants' appearance motivations, the more time they will spend on appearance-motivation framed articles. The time variable was not normally distributed, so a Spearman's Rho correlation was utilized (time spent on appearance articles: skewness of 2.669, kurtosis of 9.116). The hypothesis was not supported. There was no significant relationship between appearance motivations and time spent on appearance-motivation framed articles, $r_s(165) = .024$, $p = .756$.

Research Question 1 stated: Which motivation-framed articles will participants who have both high health and high appearance motivations spend the most time on? People with both high health and high appearance motivations were defined as those who had appearance and health motivation scores of 5 or higher, which meant that their responses averaged out to *agree* or *strongly agree* to questions about their motivations. A paired samples t-test was used, only including the respondents who met the criteria ($n = 53$). There was no significant difference

between time spent on health-motivation framed articles ($M = 52.96$, $SD = 91.93$) and on appearance-motivation framed articles ($M = 47.00$, $SD = 51.66$), $t(24) = -.434$, $p = .668$.

To test hypothesis 2a and b, a health-motivation framed article selection score and an appearance-motivation framed article selection score were tabulated for each participant. There were only three possible scores for each topic. The scores for the health-motivation framed articles were as follows: 0 for no health-motivation framed articles selected first, 1 when a health-motivation framed article was selected first in one of the topics (nutrition or exercise), and 2 when health-motivation framed articles were selected first in both topics. The scores for the appearance-motivation framed articles were calculated in the same manner. Hypothesis 2a and b were both tested in two ways: using the health and appearance motivation scores and the forced-choice health and appearance motivation scores as the independent variables (see Methods section for explanation of how both variables were created).

Hypothesis 2a states: The stronger the participants' health motivations, the more likely they will be to select health-motivation framed articles first over appearance-motivation framed articles. A one-way ANOVA was used to test the linear trend. The hypothesis was supported by both tests. The trend indicated that people who had higher health motivations were more likely to select health-motivation framed articles first. The results of the first test using health motivations as the independent variable are as follows: $F (1, 264) = 14.513$, $p = 0$, $\eta^2 = .052$. As the figure below demonstrates, the higher the health score, the higher the likelihood of selecting two health-motivation framed articles [0 health articles selected first ($n = 62$, $M = 4.60$, $SD = .86$), 1 health article selected first ($n = 90$, $M = 4.89$, $SD = .75$), and 2 health articles selected first ($n = 115$, $M = 5.05$, $SD = .70$)].
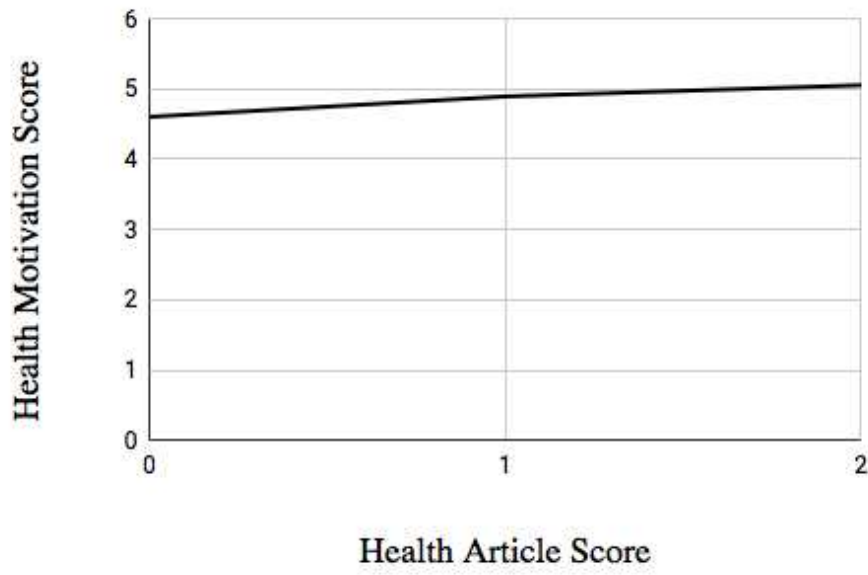
Figure 1. H2a Line Graph. Relationship between health motivations and health-motivation framed article selection score.

The results of the second test of H2a using the forced-choice health motivations as the dependent variable are as follows: F (1, 264) = 104.530, p = 0, η^2 = .307, 0 health articles selected first (n = 62, M = .56, SD = .77), 1 health article selected first (n = 90, M = 1.03, SD = .71), and 2 health articles selected first (n = 115, M = 1.84, SD = .87). The trend is demonstrated in the figure on the following page.
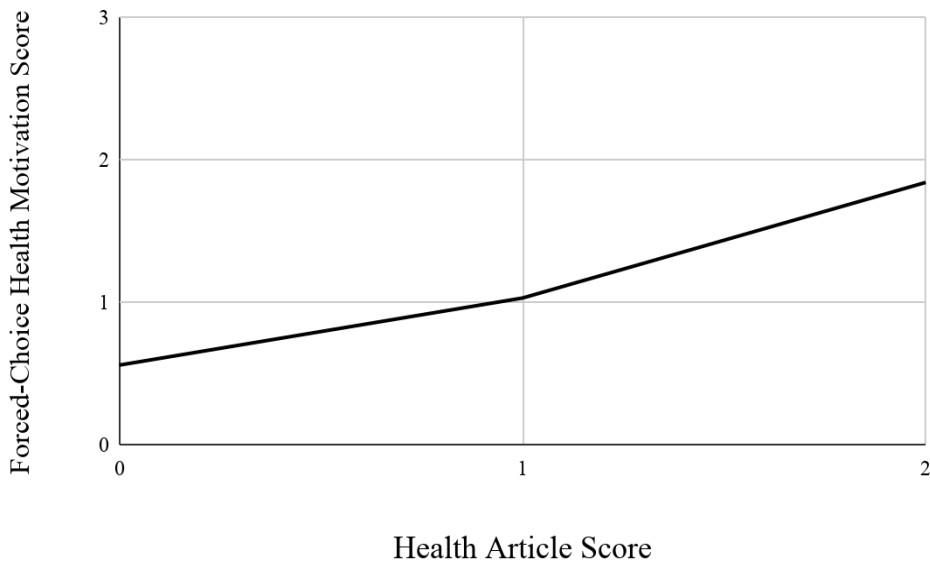
Figure 2. H2a Line Graph. Relationship between forced-choice health motivations and health-motivation framed article selection score.

Hypothesis 2b states: The stronger the participants' appearance motivations, the more likely they will be to select appearance-motivation framed articles first over health-motivation framed articles. A one-way ANOVA was used to test the linear trend. The hypothesis was supported by both tests. The trend indicated that people who had higher appearance motivations were more likely to select appearance-motivation framed articles first. The results of the first test using appearance motivations as the independent variable are as follows: $F (1, 264) = 8.003, p < .01, \eta^2 = .043$. As the figure below demonstrates, the higher the appearance score, the higher the likelihood of selecting appearance-motivation framed articles [0 appearance articles selected first ($n = 115, M = 4.20, SD = .96$), 1 appearance article selected first ($n = 90, M = 4.55, SD = .75$), and 2 appearance articles selected first ($n = 62, M = 4.63, SD = .92$)].
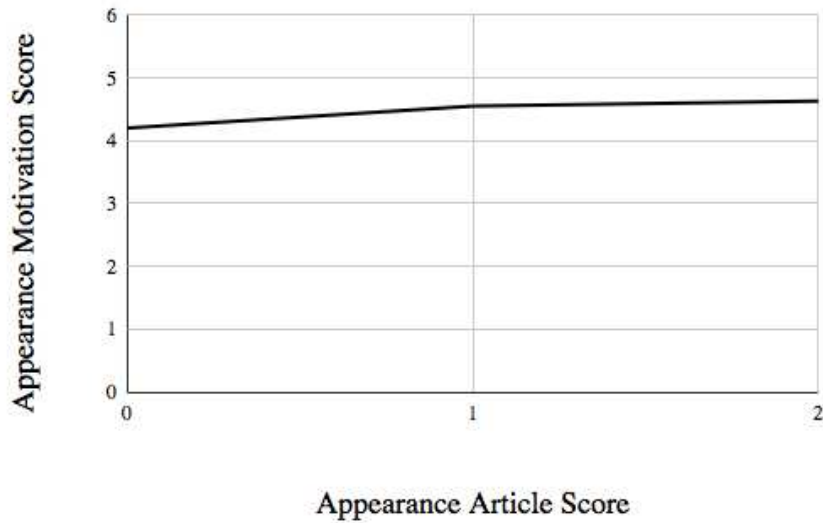
Figure 3. H2b Line Graph. Relationship between appearance motivations and appearance-motivation framed article selection score.

The results of the second test of H2b using the forced-choice appearance motivations as the dependent variable are as follows: $F (1, 264) = 102.302, p = 0, \eta^2 = .28$, 0 appearance articles selected first ($n = 115, M = .26, SD = .53$), 1 appearance article selected first ($n = 90, M = .61, SD = .68$), and 2 appearance articles selected first ($n = 62, M = 1.40, SD = 1.01$). The trend is demonstrated in the figure on the following page.
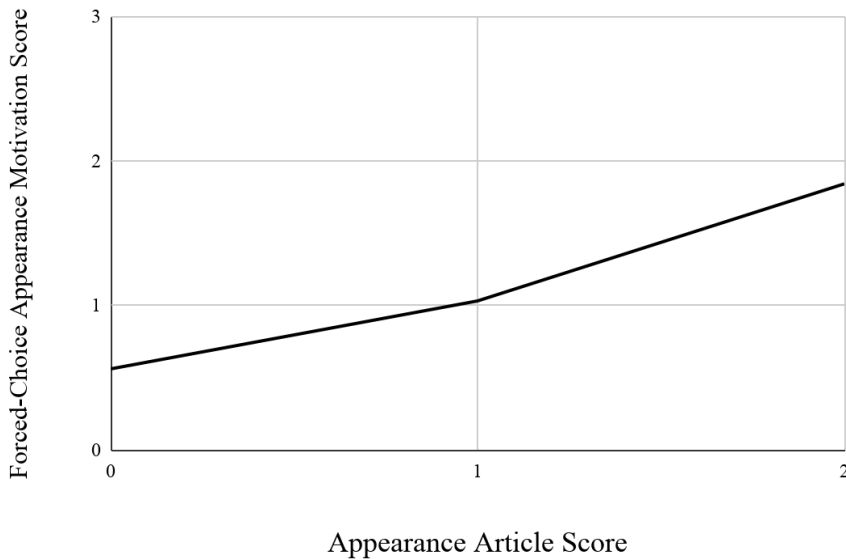
Figure 4. H2b Line Graph. Relationship between forced-choice appearance motivations and appearance-motivation framed article selection score.

Research question 2 states: Which type of motivation-framed articles will participants who have both high health and high appearance motivations select first? As with research question 1, only respondents with health and appearance motivation scores of 5 or higher were included in the analysis ($n = 53$). To investigate this research question, a one-sample chi-square test was used. For this analysis, 13 participants (24.5%) selected 0 health-motivation framed articles first, 20 participants (37.7%) selected 1 health-motivation framed article first, and 20 participants (37.7%) selected health-motivation framed articles first for both topics. The results were naturally the same for the appearance-motivation framed articles, but in reverse order. Twenty participants (37.7%) selected 0 appearance-motivation framed articles first, 20 participants (37.7%) selected 1 appearance-motivation framed article first, and 13 participants (24.5%) selected appearance-motivation framed articles first for both topics. Results of a chi-square analysis indicate that for participants who were highly motivated by both appearance and health, there was no pattern to their first article selection, $X_2(2) = 1.849$, $p = .397$.

Hypothesis 3 states: Participants will spend more time on gain-strategy framed articles than on loss-strategy framed articles. A paired samples t-test was used. The hypothesis was not supported. The time spent on gain-strategy articles ($M = 47.10$, $SD = 84.62$) and loss-strategy framed articles ($M = 31.77$, $SD = 60.22$) was not significantly different, $t(102) = 1.749$, $p = .083$.

Hypothesis 4a states: Women will spend more time reading appearance-motivation framed articles than will men. As time spent on appearance-motivation framed articles was not normally distributed (skewness of 2.669, kurtosis of 9.116), a Mann-Whitney U test was used. The hypothesis was not supported. Time spent on appearance-motivation framed articles was not significantly different between males ($Mdn = 79.42$) and females ($Mdn = 85.16$), $U = 3110$, $z = -.772$, $p = .44$.

Hypothesis 4b: Women will be more likely to select appearance-motivation framed articles first than will men. A chi-square was used to test the relationship. The hypothesis was not supported. There was no significant difference between males and females for the likelihood of selecting an appearance-motivation framed article first $X_2(2) = .098$, $p = .952$ (see Table 5 below).

Table 5
Appearance Article Selection Scores for Males and Females

	Appearance Article Score			
	0	1	2	Total
Female count	60	47	31	138
Male count	55	41	30	126

Research question 3a states: Is there a relationship between level of health behavior involvement and time spent on appearance- vs. health-motivation framed articles? As previously mentioned, the exercise involvement (measured as exercise frequency) and nutrition involvement

(measured as healthy nutrition involvement) variables were kept separate for analysis. The following four paragraphs present the results.

There was a weak, positive relationship between exercise frequency and time spent on appearance-motivation framed articles, $r_s(155) = .184$, $p = .021$.

There was no relationship between exercise frequency and time spent on health-motivation framed articles, $r_s(197) = -.102$, $p = .151$.

There was no relationship between healthy nutrition involvement and time spent on appearance-motivation framed articles, $r_s(212) = .107$, $p = .118$.

There was no relationship between healthy nutrition involvement and time spent on health-motivation framed articles, $r_s(163) = .099$, $p = .202$.

There is a relationship between exercise involvement and time spent on motivation-framed articles; as exercise frequency increases, so does time spent on appearance-motivation framed articles. However there is no relationship between healthy-nutrition involvement and time spent on motivation-framed articles.

Research question 3b states: Is there a relationship between level of health behavior involvement and likelihood of appearance- vs. health-motivation framed articles being selected first? One-way ANOVA tests were used to investigate RQ3b.

There was no significant difference among groups for exercise frequency and the health-motivation framed article selection score, (for 0 health-motivation framed articles selected first, $n = 59$, $M = 43.59$ $SD = 34.65$; for 1 health-motivation framed article selected, $n = 85$, $M = 35.84$, $SD = 27.15$; for selecting health-motivation framed articles first in both topics, $n = 106$, $M = 39.08$, $SD = 33.30$), $F(1, 247) = .770$, $p = .354$ (See Figure 5).
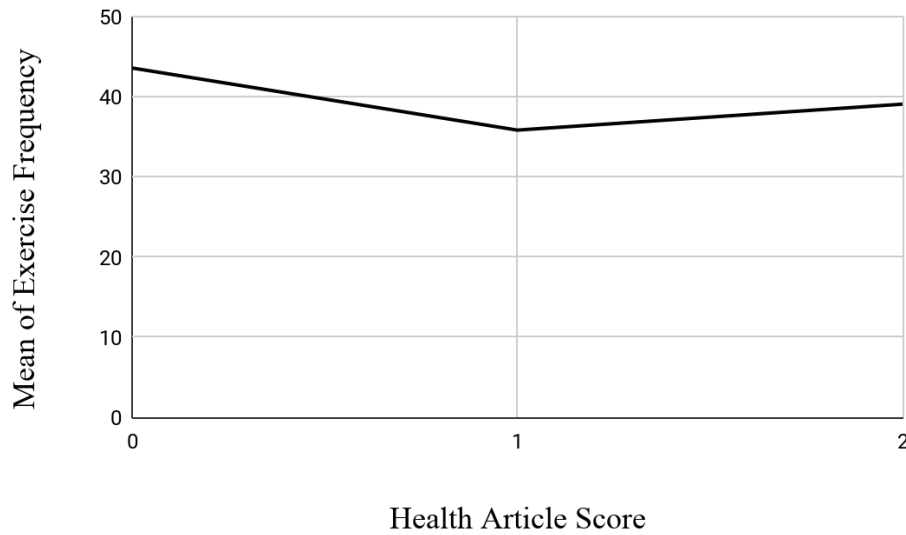
Figure 5. RQ3b Line Graph. Relationship between mean of exercise frequency score and health-motivation framed article score

Therefore, there is also no relationship between exercise frequency and the likelihood of selecting an appearance-motivation framed article first.

There was a significant difference among the groups for healthy nutrition involvement and health-motivation framed article selection score. As shown in Figure 6, there was a positive linear relationship between healthy nutrition involvement and the likelihood of health-motivation framed articles being selected first, (for 0 health-motivation framed articles selected first, $n = 62$, $M = 3.79$, $SD = .80$; for 1 health-motivation framed article selected first, $n = 90$, $M = 4.05$, $SD = .78$; for selecting health-motivation framed articles first for both topics, $n = 115$, $M = 4.13$, $SD = .76$), $F(1, 264) = 7.712$, $p = .006$, $\eta^2 = .029$.
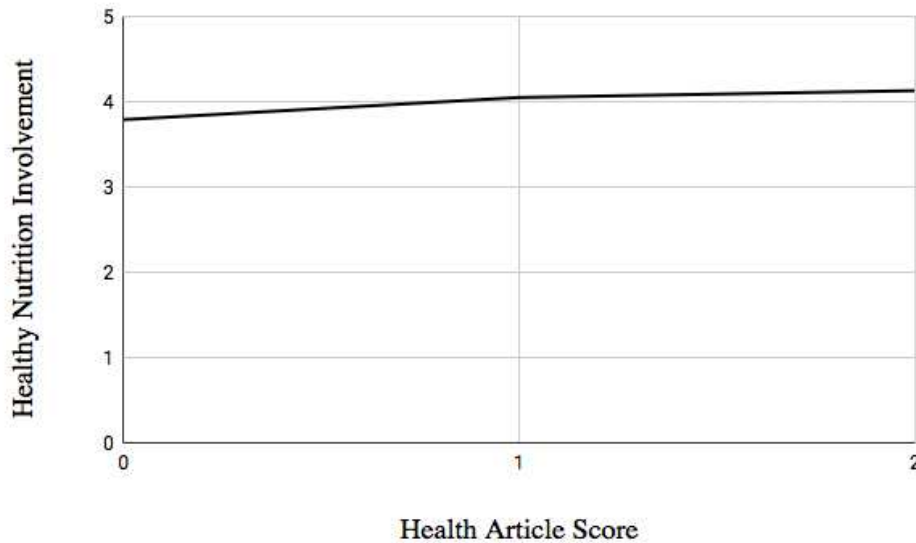
Figure 6. RQ3b Line Graph. Relationship between healthy nutrition involvement score and health-motivation framed article score

Therefore, there was a negative relationship between healthy nutrition involvement and the likelihood of selecting an appearance-motivation framed article first.

There is a relationship between healthy nutrition involvement and likelihood of health vs. appearance motivation-framed articles being selected first; as healthy nutrition involvement increases, so does likelihood of a health-motivation framed article being selected first. However there is no relationship between exercise involvement and likelihood of health vs. appearance motivation-framed articles being selected first.

Hypothesis 5a states: The higher a participant's health behavior involvement, the more time spent on loss-strategy framed articles. The hypothesis was not supported. There was no significant relationship between exercise frequency and time spent on loss-strategy framed articles, $r_s(117) = .017$, $p = .856$. There was also no significant relationship between healthy nutrition involvement and time spent on loss-strategy framed articles, $r_s(123) = .176$, $p = .050$.

Hypothesis 5b states: The lower a participant's health behavior involvement, the more time spent on gain-strategy framed articles. The hypothesis was not supported. There was no

significant relationship between exercise frequency and time spent on loss-strategy framed articles, r_s (227) = .017, p = .287. However, for healthy nutrition involvement, there was a weak positive relationship between healthy nutrition involvement and time spent on gain-strategy framed articles, but it was in the opposite direction than predicted, r_s (243) = .132, p = .040.

Hypothesis 5c states: The higher a participant's health behavior involvement, the higher the likelihood that loss-strategy framed articles will be selected first over gain-strategy framed articles. The hypothesis was not supported. There was a significant negative relationship between exercise frequency and likelihood of selecting a loss-strategy framed article first [F (1, 247) = 5.993, p = .015], which is opposite to what the hypothesis predicted (for 0 loss-strategy framed articles selected first, n = 156, M = 44.50, SD = 34.50; for 1 loss-strategy framed article selected first, n = 68, M = 30.58, SD = 25.16; for selecting loss-strategy framed articles first for both topics, n = 26, M = 28.42, SD = 20.70.

For healthy nutrition involvement, there was no significant relationship between healthy nutrition involvement and likelihood of selecting loss-strategy framed articles first, (for 0 loss-strategy framed articles selected first, n = 168, M = 4.07, SD = .79; for, 1 loss-strategy framed article selected first, n = 72, M = 3.98, SD = .85; (for selecting loss-strategy framed articles first for both topics, n = 27, M = 3.85, SD = .79), F(1, 264) = 1.851, p = .175.

Research question 4a states: Is there a relationship between participants' attitudes towards a health behavior and time spent on appearance- vs. health-motivation framed articles? No relationship was found between attitudes towards a health behavior and time spent on appearance-motivation framed articles, (r_s (165) = .068, p = .379) or between attitudes towards a health behavior and time spent on health-motivation framed articles (r_s (212) = .078, p = .258).

Research question 4b states: Is there a relationship between participants' attitudes towards a health behavior and the likelihood of appearance- vs. health-motivation framed articles being selected first? There was a positive relationship between attitude towards the health behaviors and likelihood of selecting a health-motivation framed article first: 0 health-motivation framed articles selected first ($n = 62$, $M = 5.52$, $SD = .83$), 1 ($n = 90$, $M = 5.7$, $SD = .65$), and 2 ($n = 115$, $M = 5.8$, $SD = .75$), $F(1, 264) = 5.968$, $p = .015$. Therefore, there was a negative relationship between attitude towards the health behaviors and likelihood of selecting an appearance-motivation framed article first.

Research question 4c states: Is there a relationship between participants' attitudes towards a health behavior and time spent on gain- vs. loss-strategy framed articles? There was a weak positive relationship between participants' attitudes towards the health behaviors and time spent on gain-strategy framed articles, $r_s(265) = .133$, $p = .038$. However, there was no relationship between participants' attitudes towards a target behavior and time spent on loss-strategy framed articles, $r_s(123) = .098$, $p = .275$. There is a positive relationship between attitudes towards a health behavior and time spent on gain-strategy framed articles, but no relationship between attitudes towards a health behavior and time spent on loss-strategy framed articles.

Research question 4d states: Is there a relationship between participants' attitudes towards a health behavior and the likelihood of gain- vs. loss-strategy framed articles being selected first? There was a significant positive relationship between attitude towards the health behaviors and the likelihood of selecting a gain-strategy framed article first: 0 gain articles selected first ($n = 27$, $M = 5.47$, $SD = 1.01$), 1 ($n = 72$, $M = 5.56$, $SD = .67$), and 2 ($n = 168$, $M = 5.8$, $SD = .71$), $F(1, 264) = 4.486$, $p = .035$, $\eta^2 = .029$. Therefore, there was a negative

relationship between attitude towards the health behaviors and likelihood of selecting a loss-strategy framed article first.

Chapter 5: Discussion, Limitations & Future Research

Discussion

The current study investigated how individual differences affect selective exposure to variously framed health messages. This study investigated a logical early step in this information dissemination process: selective exposure. It is not possible for a message to successfully promote behavior change if it is not selected or attended to in the first place. The evidence from this study suggests that there are patterns between individual differences and message selection. The study contributes to selective exposure, strategic communication, and health communication literature, as well as contributing to message tailoring for social marketing of healthy behavior changes and maintenance.

Some of the strengths of the study are that multiple health topics were investigated (healthy nutrition and exercise). There was no difference in the time spent on articles across the exercise and healthy nutrition topics; this suggests that the results are not topic specific, and may apply to other health prevention behaviors. Another strength of the study is that selective exposure was measured in two ways: which article was selected first, and how long was spent on the article.

With regard to results from testing hypotheses, the tests that analyzed motivations for engaging in the behavior produced results in-line with theories of selective exposure, cognitive dissonance, and confirmation bias; the participants attended to messages that were in line with their motivations (Festinger, 1957; Knobloch-Westerwick, 2014). However, it was not across both measures of selective exposure. While the first article participants selected was framed consistently with their motivations (health vs. appearance) for engaging in the behavior (exercise

and healthy nutrition), there was no relationship between health or appearance motivations, and time spent on the corresponding articles.

A possible explanation for this inconsistent pattern is that time spent on an article is a fairly new measure of selective exposure and has only been used in a few studies (Knobloch-Westerwick et al., 2013; Knobloch-Westerwick & Sarge, 2015). It is possible that there are alternative explanations for time spent on articles. For example, it is possible that since people who are more motivated by appearance reasons are selecting appearance-motivation framed articles first, and the same with health motivations and health-motivation framed articles, it is reasonable to assume that they have read information on this topic in the past. The information in the first article they selected may not have been novel to them, and was therefore easier to process and skim, or they may have stopped reading sooner since the information may not have been new. It is also possible that when participants are spending time on articles that are not consistent with their motivations, they are spending time counter arguing the information. Deeper investigation into the processing of these variously framed messages is needed to provide an in-depth explanation on why people aren't spending more time on articles in line with their motivations.

The fact that the participants started by selecting articles consistent with their motivations for engaging in the health behaviors is in line with selective exposure theories (Festinger, 1957; Knobloch-Westerwick, 2014). To my knowledge, this appears to be the first study to look at how motivations for engaging in the health behaviors affect selective exposure to health messages. Other studies have looked at motivation-frame effects on behavior (Gallagher and Updegraff, 2014; Morris et al., 2014), or self-standards and behavior's effect on selective exposure (Knobloch-Westerwick et al., 2013). The results on motivations from the current study are a

unique contribution to the literature. The results provide evidence in support of the importance of motivations in health messages (Murray-Johnson & Witte, 2003), as well as insight into how these motivations affect message selection.

The analyses on gender and message selection yielded some surprising results. Objectification theories suggested that women would be more likely to select and spend more time on appearance-motivation framed articles than would men (e.g., Conlin & Bissell, 2014; Frederickson & Roberts, 1997; Simpson & Mazzeo, 2016). This study found no significant difference between men and women with regard to health-motivation framed vs. appearance-motivation framed article selection and time spent on articles. This result is interesting, as women have been found to be more likely to internalize the societal emphasis on appearance than men (Calogero et al., 2011).

The fact that the results from this study were counter to objectification theory could have multiple explanations. It is possible that men are starting to internalize the emphasis society places on appearance just as much as women are, as multiple other studies have found that men also experience the effects of objectification (e.g., Olivardia, Pope, Borowiecki, & Cohane, 2004; Schwartz, Grammas, Sutherland, Stiffer, & Bush-King, 2011). It is also possible that social desirability bias impacted how the women responded to the questions on motivations for engaging in the health behaviors; they may have believed that they would be seen as vain, or were embarrassed that they were more concerned about appearance than health. Another possible explanation is that men may be clicking on appearance-motivation framed articles because they do not typically seek that information, and it is, therefore, novel to them. The age of the sample may also be a reason for the lack of difference between men and women, as young men and women may be equally concerned with appearance.

The location of the study may also have impacted the results, as Colorado is known for being one of the healthiest states in the country with regard to obesity and physical activity levels (CDC, 2015; CDC, 2017); both men and women may have been more concerned with health compared to the average American college student. Future research would be valuable in providing additional explanation for the non-significant differences in message preference between males and females.

With regard to level of involvement in the behavior, the results across the two measures of selective exposure were mixed. As exercise frequency increased, so did time spent on appearance-motivation framed articles; however, there was no relationship between exercise frequency and likelihood of selecting an appearance- vs. health-motivation framed article first. Shifting from the exercise topic to the nutrition topic, there was no relationship between healthy nutrition involvement and time spent on appearance- or health-motivation framed articles. However, as level of healthy nutrition involvement increased, so did likelihood of selecting a health-motivation framed article first. In brief, exercise involvement only had a relationship with time spent on motivation-framed articles, whereas healthy nutrition involvement only had a relationship with motivation-framed article selection. Exercise had a positive relationship with appearance-motivation framed articles, and healthy nutrition involvement had a positive relationship with health-motivation framed articles.

There are multiple possible explanations for the mixed results involving behavior involvement and article selection. It is possible that the different measures of exercise and nutrition involvement explain the mixed results. Exercise involvement was measured in terms of self-reported exercise frequency, whereas healthy nutrition involvement was measured in terms of whether nutrition is of concern when selecting food (the healthy nutrition level of involvement

variable is not the true equivalent of the exercise variable). While a food journal would have provided measures of nutrition involvement that were more similar to exercise frequency, it was impractical for the current study, as this would be very time consuming for the participants and the main focus of this study was selective exposure. It is also possible that people think differently about nutrition than they do about exercise. For example, what is considered to be exercise is more universally understood than what is considered to be healthy eating (e.g., some diets, such as the paleo diet, accept animal fats in moderation as necessary for healthy eating, whereas other diets consider animal fats to be very unhealthy). However, this study was not concerned with whether or not the participants actually ate healthy, but rather their perception of how healthy they ate.

As mentioned in the earlier discussion on motivations and message selection, it is possible that while individual differences may predict the frame of the first article selected (as with motivations for engaging in the behavior), other processes may be at work with regard to time spent on the articles, e.g., how the information is processed. Participants may be spending more time on messages that have novel information, or they may be spending time counter-arguing information in the messages that aren't in-line with their cognitions.

This study also looked at gain- vs. loss-strategy framed messages. Literature suggested that gain-strategy framed messages were better suited to prevention behaviors (such as exercise and healthy eating) than were loss-strategy frames (Rothman & Salovey, 1997); however, the aforementioned study investigated message effectiveness as opposed to the current study that examined message selection. This study did not find that more time was spent on gain-strategy framed articles than on loss-strategy framed articles. However, the current results are consistent with other research: O'Keefe & Jensen (2007) conducted a meta-analysis and found that gain-

framed messages were no more persuasive than loss-framed messages in promoting physical activity.

Continuing the discussion on strategy frames, the literature shows that higher the levels of involvement in the subject or behavior enable better processing of loss-strategy framed messages or fear appeals, whereas lower involvement in the subject results in less subject knowledge and less processing of loss-strategy framed messages (Nan, 2007; Rothman & Salovey, 1997; Wansink & Pope, 2015). Counter to what the literature suggested, in this study, as healthy nutrition involvement increased, so did time spent on gain-strategy framed articles. Also counter to what was predicted, the higher the exercise frequency, the higher the likelihood of selecting a gain-strategy framed message first. However, there was no relationship between exercise frequency and time spent on gain- vs. loss-strategy frames. There was also no relationship between healthy nutrition involvement and likelihood of gain- vs. loss-strategy frames being selected first: the results produced by the analyses on level of involvement in the behavior are mixed with both the motivation framed articles, and the strategy framed articles.

Looking at the last individual difference this study looked at, the results of this study help to extend our understanding of attitude and selective exposure. The literature did not suggest how attitude would impact selective exposure, but only that attitudes affect message processing (Rosen, 2000) and exposure can affect attitudes (Gallagher & Updegraff, 2011). This study found that the more positive the attitude towards the target behavior, the more time spent on gain-strategy framed articles, and the higher the likelihood of the gain-strategy framed articles being selected first. While there was no prediction on how attitude would affect selective exposure, it seems logical that people with a more positive attitude towards exercise and healthy nutrition would be more likely to attend to the positive or gain-strategy framed messages. With

regard to the relationship between attitudes and motivation frames, the more positive the attitudes towards the health behaviors, the higher the likelihood of a health-motivation frame message being selected first. However, attitude towards the health behavior was not related to time spent on appearance- vs. health-motivation framed messages. The results on how attitudes affect selective exposure make a seemingly new contribution to the literature.

In summary, the current study yielded some interesting results that are both in line with and counter to the literature. This appears to be the first study to look at selective exposure to health and weight loss related (healthy nutrition and exercise) information specifically. Therefore, it begins to bridge the gap in the literature, as most studies have evaluated the effectiveness of variously framed messages in encouraging behavior change (e.g., Gallagher & Updegraff, 2011; O'Keefe & Jensen, 2007; Rothman and Salovey 1997), as opposed to which messages will be attended to in the first place.

As expected, participants first selected messages that were in line with their motivations (health and appearance) for engaging in the health behavior, which is in line with theories of selective exposure (Festinger, 1957, Knobloch-Westerwick, 2014; Sears & Freedman, 1967). However, other individual differences, such as gender, level of involvement in the health behavior, and attitude towards the target behavior yielded more inconsistent results with regard to message selection and time spent reading the messages. Gender surprisingly did not predict message selection. Also, level of involvement in the behavior was inconsistent in predicting which message frames participants selected first and which messages they spent the most time on. Attitude towards the target behaviors was more consistent in that people with positive attitudes towards the health behaviors attended to gain-strategy framed messages.

The results from the two measures of selective exposure (time and article choice) were inconsistent. For some analyses, there was a significant relationship between the independent variable and time spent on a certain message-frames, but no relationship between the independent variable and the likelihood of that same message-frame being selected first, and vice versa. The validity of these measures of selective exposure needs further investigation to parse out why these results are inconsistent, and suggestions for future research are discussed in more detail in the final section.

Individual differences among people appear to affect message selection: there is no one size fits all approach to message framing with regard to health and weight loss related messages. Message tailoring appears to be essential in order to break through the clutter: message tailoring is catering messages to individuals based on their individual differences (Kreuter & Wray, 2003). For example, if we could use algorithms to determine whether health or appearance motivates a person based on the person's search history, then health messages in line with their motivations could be placed in front of them, possibly in the form of advertised content on a Google search or suggested articles to read on websites they are already visiting.

This study added to the growing body of selective exposure literature, both theoretically and methodologically. It also added to the body of strategic communication, health communication, and objectification literature as well by providing insight into the practical side of message framing. The study provides additional evidence for the importance of individual differences when manipulating message framing to predict message selection (Gallagher and Updegraff, 2011; Wansink & Pope, 2015). Yet, this study leaves plenty to be investigated to better inform the creation of messages that will break through the clutter to promote healthy eating and exercise.

Limitations

The current study has some limitations that need to be taken into account when considering the results. First, the study used a convenience sample at a single location, Colorado State University; therefore, the results do not allow for a population inference to be made, but rather a process inference. While college students were the population of interest, because they are in the early stages of adulthood (average age of 22 years), using a college student sample also means that the results may be specific to college students and may not generalizable to other age groups. Being college students, the participants were also educated, which means both that they may be more aware of the obesity issue and about the importance of good health, and that the results are not generalizable to other groups who have differing levels of education. The study only included college students at one location. It is possible that the results are specific to college students in Colorado, or even specific just to CSU students. Colorado is among the three thinnest states in the country based on the obesity percentage rates, and Colorado is in the top ten for percentage of adults meeting physical activity guidelines (CDC, 2015a), so it is possible that the results are specific to Coloradoans.

The experiment also creates a somewhat artificial environment, and it is not possible to say whether the participants would actually search for the types of information presented in the study. It is also not possible to know if the participants would have read the articles they chose if they had a larger, more realistic number of choices. While experiments are artificial by nature, this study was more natural than a typical experiment, as the participants were not brought into the lab and were able to participate on their personal laptop from wherever they chose. Taking the study in a more natural environment minimizes the artificiality, but also introduces other

limitations. It is possible that the participants had distractions or were multi-tasking while participating, and in turn were not giving the study their full attention.

This study is also limited in that it only addresses prevention health behaviors and not detection health behaviors. With regard to message framing, research suggests that health prevention behaviors should be treated differently from health detection behaviors (e.g., cancer screenings and testing for HIV), as the perceived risks are evaluated differently (Rothman & Salovey, 1997). Therefore the results are not generalizable to health detection behaviors.

This study utilized self-reported measures for the independent variables. It is hard to know how accurate participants' self-reported information is. Participants may not be able to accurately recall their previous behavior or may provide more socially desirable answers. However, survey design best practices (Dillman et al., 2014) were utilized to minimize these issues. For example, participants were reminded that their answers were anonymous prior to more personal questions, such as weight. The participants were also reminded that there were no right or wrong answers, and that their honest answers and opinions were valuable to the research.

The measure of healthy nutrition involvement was created for this study. While the questions were from previous studies and scale reliability was acceptable, hypothesis testing that involved both the exercise and healthy nutrition involvement measures produced mixed results across the two topics. This may be a limitation of the healthy nutrition measurement, as the validity of the scale has not been tested, and it is not the true nutrition equivalent to exercise frequency.

With regard to time as a measure of selective exposure, it is not possible to know with certainty the reason that people were spending more or less time on certain framed articles. While it has been found that time can be a measure of selective exposure (Knobloch-Westerwick

et al., 2013) (i.e., that people spend time on messages that agree with their attitudes, beliefs, etc.), it is also possible that people may be spending time counter arguing messages that are against their attitudes, beliefs. The time measure is a measure of selective exposure, and time spent on messages does mean that processing is happening, but the time measure cannot provide information on how the message is being processed. Additional research is needed to determine how the messages are being processed. Specific future research recommendations are discussed in the following section.

Future Research

The current study investigated how health behavior involvement, attitudes towards the health behavior, and motivations for engaging in the behavior affect selective exposure to variously framed health messages. The study investigated how online article selection differed between health- versus appearance-motivation framed messages, and gain- versus loss-strategy framed messages. This is one of the few studies that has investigated selective exposure to health messages using unobtrusive observation (Knobloch-Westerwick et al., 2013; Knobloch-Westerwick & Sarge, 2015). Therefore, replication of the study is important to ensure validity and reliability.

It is important to replicate this study in other populations including those where the obesity epidemic is a bigger problem, e.g., in southern U.S. states (CDC, 2017). It would also be of interest to replicate this study in other countries. A population of personal interest is South Africans. South Africa is also dealing with an obesity epidemic; in South Africa, the epidemic is often attributed to the social desirability of larger body types, as being thin is commonly associated with illness, such as HIV and AIDS (Puoane, Fourie, Shapiro, Rosling & Tshaka,

2005). However, there is evidence of westernization in South African populations (Puoane, Tsolekile, & Steyn, 2010) in the sense that there is a relatively new desire to be thinner, especially for women (Senekal, Steyn, Mashego, & Nel, 2001). It may be more important now than it was before to promote healthy weight-related behaviors due to the globalization of American companies that are associated with unhealthy food products, such as Krispy Kreme donuts and Starbucks. Those companies launched stores in South Africa in 2015 and 2016, respectively (Business Tech, 2015; Chutel & Khan, 2016).

There is potential to conduct secondary data analysis with the results from the current study. For example, every article had both a motivation frame (health vs. appearance) and a strategy frame (gain vs. loss). An investigation of the interaction effects of the message frames may provide additional insight into the relationships between individual differences and message selection. There was additional information collected from the participants that was not used in the current study. Qualitative data were collected in the form of the answers to open-ended questions about why the participants selected the articles they did. These data may provide deeper insight into participants' motivations for message selection and may provide additional explanation for some of the results. Participant weight and height was also collected, which will enable a BMI calculation. A future study could investigate the relationship between BMI and the variables of interest in this study. It would be interesting to see if people who are overweight or obese have different motivations and message preferences than those participants who are of normal weight or even underweight.

The unobtrusive measures of selective exposure used in this study are relatively new (i.e., measuring which articles participants selected and how much time they spent on them). It is important to parse out these measures to better understand why people may be more drawn to

select one article first, but spend more time on another article. Understanding why there is a difference between which article frames are selected first and total time spent on article frames will require a more in-depth analysis of participants' motivations for selecting the articles and how they are processing these articles. A possible method to investigate how the articles are being processed would be to use cognitive interviews, where participants talk about what they are thinking while completing the stimuli section of the current study.

The article topics selected for this study were not likely to evoke dissonance as all of the articles promoted behaviors that are widely considered to be beneficial to a person's health. A future study could include articles that have the potential to evoke dissonance, such as using topics that are more controversial or are against a person's beliefs. For example, if a person does not believe that weight lifting is beneficial, cognitive dissonance suggest that the person would avoid articles that present the benefits of weightlifting and instead select an article that highlights the risks of weightlifting.

This study only displayed article headlines when presenting the stimuli. It is typical for suggested articles online to include a picture (e.g., livestrong.com, elitedaily.com). It is possible that the use of a picture that emphasizes appearance may have a stronger appeal than just text. A possible future study would be to investigate the effects of visual elements on selective exposure.

The results of this study showed no significant differences between males and females in their selection of appearance- vs. health-motivation framed articles. These results go against a large part of the objectification literature, as women have been found to be more affected by objectification, and, therefore, more concerned with appearance than men (e.g., Calogero et al., 2011; Conlin & Bissell, 2014; Frederickson & Roberts, 1997; Simpson & Mazzeo, 2016). While there were multiple possible explanations given for these results in the Discussion section of this

chapter, further investigation into why there is no difference between males' and females' preference in messages is necessary to determine the true reason for this result. Qualitative research methods (e.g., in-depth interviews) appear to be best suited to answer this question, as qualitative methods allow for more open-ended exploration and can offer a more in-depth understanding of the phenomenon.

The current study found that people will likely select messages in line with their motivations. A logical next step would be to investigate whether being exposed to messages in line with motivations for exercising and healthy nutrition actually leads to consistent exercise and good food choices after exposure.

References

Akl, E, A., Oxman, A. D., Herrin, J., Vist, G. E., Terrenato, I., Sperati, F., Costiniuk, C., Blank, D., & Schünemann. (2011). Framing of health messages. *Cochrane Database of Systematic Reviews, 12,* 1-81. doi: 10.1002/14651858.CD006777.pub2

American Press Institute. (2015). *How Millennials Get News: Inside the Habits of America's First Digital Generation*. Retrieved from http://www.americanpressinstitute.org/wp-content/uploads/2015/03/How-Millennials-Get-News-Media-Insight-Project-March-2015-FINAL.pdf

Apanovitch, A. M., McCarthy, D., & Salovey, P. (2003). Using message framing to motivate HIV testing among low-income, ethnic minority women. *Health Psychology, 22*, 60–67.

Aubrey, J. S. (2006). Exposure to sexually objectifying media and body self-perceptions among college women: An examination of the selective exposure hypothesis and the role of moderating variables. *Sex Roles, 55*, 159-172. doi: 10.1007/s11199-006-9070-7

Aubrey, J. S. (2010). Looking good versus feeling good: An investigation of media frames of health advice and their effects on women's body-related self-perceptions. *Sex Roles, 63*(1-2), 50-63.

Bachl, M. (2017). Selective exposure and hostile media perceptions during election campaigns. *International Journal of Public Opinion Research*, *29*(2), 252-262

Blacklock, R. E., Rhodes, R. E., & Brown, S. G. (2007). Relationship between regular walking, physical activity, and health-related quality of life. *Journal of Physical Activity & Health, 4*(2), 138-152.

Booth, M.L. (2000). Assessment of physical activity: An international perspective. *Research Quarterly for Exercise and Sport, 71*(2), s114-20.

Business Tech, Staff Writer. (2015, November 25). Krispy Kreme launches in South Africa: Everything you need to know. *Business Tech.* Retrieved from https://businesstech.co.za/news/business/105185/krispy-kreme-launches-in-south-africa-everything-you-need-to-know/

Calogero, R. M., Tantleff-Dunn, S., & Thompson, J. K. (2011) *Self-Objectification in women: Causes, consequences and counteractions*. Washington, D.C.: APA.

Centers for Disease Control and Prevention. (2015a). *Nutrition, Physical Activity and Obesity: Data, Trends and Maps*. Retrieved from https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTopic &islClass=PA&islTopic=PA1&go=GO

Centers for Disease Control and Prevention. (2015b) *Prevalence of obesity among adults and youth: United States, 2011–2014* [Data brief]. Retrieved from https://www.cdc.gov/nchs/data/databriefs/db219.pdf

Centers for Disease Control and Prevention. (2016). *Adult obesity causes and consequences*. Retrieved from https://www.cdc.gov/obesity/adult/causes.html

Centers for Disease Control and Prevention. (2017). *Adult obesity prevalence maps*. Retrieved from https://www.cdc.gov/obesity/data/prevalence-maps.html

Chaudhury, M., Falaschetti, E., Fuller, E., Mackenzie, H., Mindell, J., Nicholson, S.,… Wardle, H. (2008). Health survey for England - 2007: Healthy lifestyles: knowledge, attitudes, and behaviour. *National Health Service.* Retrieved from: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/health-survey-for-england-2007-healthy-lifestyles-knowledge-attitudes-and-behaviour

Chutel, L., & Khan, N. (2016, April 22). Starbucks is watering down its prices as it debuts in South Africa. *Quartz Africa.* Retrieved from https://qz.com/667010/starbucks-waters-down-prices-as-it-enters-south-africa-market/

Conlin, L., & Bissell, K. (2014). Beauty Ideals in the Checkout Aisle: Health-Related Messages in Women's Fashion and Fitness Magazines. *Journal of Magazine & New Media Research,* 15(2), 1-19.

Di Blasio, A., Di Donato, F., & Mazzocco, C. (2016). *Automatic report of the International Physical Activity Questionnaire.* Retrieved from https://sites.google.com/site/theipaq/scoring-protocol.

Dillman, D. A., Smyth J. A., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys; The tailored design method.* Hoboken, NJ: John Wiley & Sons Inc.

Dittmar, H., & Howard, S. (2004). Thin-ideal internalization and social comparison tendency as moderators of media models' impact on women's body-focused anxiety. *Journal of Social and Clinical Psychology*, *23*, 768–791.

Entman, R. M. (1993). Framing: Towards clarification of a fractured paradigm. *Journal of Communication, 43*, 51–58.

Festinger, L. (1957). *A theory of cognitive dissonance.* Stanford, CA: Stanford University Press.

Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*, 173-206. doi:10.1111/j.1471-6402.1997.tb00108.x

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *Journal of Psychology, 136*, 581–596.

Gallagher, K. M., & Updegraff, J. A. (2011). When 'fit' leads to fit, and when 'fit' leads to fat: How message framing and intrinsic vs. extrinsic exercise outcomes interact in promoting physical activity. *Psychology and Health, 26*(7), 819-834.

Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences, 10,* 141-146.

Goldberg, J. P. (2000). Nutrition communication in the 21st century: What are the challenges and how can we meet them? *Nutrition, 16*(7/8), 644- 646.

Graber, D.A. (1988). *Processing the news: Howpeople tame the information tide* (2nd ed.). New York: Longman.

Harring, H. A., Montgomery, K., & Hardin, J. (2010). Perceptions of body weight, weight management strategies, and depressive symptoms among US college students. *Journal of American College Health, 59*(1), 43–50.

Hayes, A. F. (2010). *Statistical methods for communication science.* New York: Routledge

Hornik, R. C. (Ed.). (2002). *Public health communication: Evidence for behavior change.* Mahwah, NJ: Lawrence Erlbaum Associates.

Hornik, R., & Kelly, B. (2007). Communication and diet: An overview of experience and principles. *Journal of Nutrition Education and Behavior, 39*(2), S5-S12.

Hu, T. W., Sung, H. Y., & Keeler, T. E. (1995). Reducing cigarette consumption in California: tobacco taxes versus an anti-smoking media campaign. *American Journal of Public Health, 85*, 1218-1222.

Hurst, M., Dittmar, H., Banerjee, R., & Bond, R. (2017). "I just feel so guilty": The role of introjected regulation in linking appearance goals for exercise with women's body image. *Body Image, 20*, 120-129.

Ingledew, D.K., Markland, D., & Strömmer, S.S. (2013). Elucidating the Roles of Motives and

    Gains in Exercise Participation. *Sport, Exercise & Performance Psychology, 3*, 116-131.

Johnston, L. (1996). Resisting change: Information-seeking and stereotype change. *European*

    Journal of Social Psychology, 26, 799-825.

Jonas, E., Schulz-Hardt, S., Frey, D., & Thelen, N. (2001). Confirmation bias in sequential

    information search after preliminary decisions: An expansion of dissonance theoretical

    research on selective exposure to information. *Journal of Personality and Social*

    Psychology, 80(4), 557-571

Jones, L. W., Sinclair, R., & Courneya, K. S. (2003). The effects of source credibility and

    message framing on exercise intentions, behaviors, and attitudes: An integration of the

    elaboration likelihood model and prospect theory. *Journal of Applied Social Psychology,*

    33(1), 179-196.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk.

    Econometrica, 47, 263–291.

Kelder, S. D., Perry, C. L. , Klepp, K. I., & Lytle, L. L. (1994). Longitudinal tracking of

    adolescent smoking, physical activity, and food choice behaviors. *American Journal of*

    Public Health, 84, 1121–1126.

Knobloch-Westerwick, S. (2014). *Choice and preference in media use: Advances in selective*

    exposure theory and research. New York, NY: Routledge, Taylor & Francis Group.

Knobloch-Westerwick, S. & Crane, J. (2012). A losing battle, the effects of prolonged-exposure

    to thin ideal images on dieting and body dissatisfaction. *Communication Research, 39*(1),

    79-102.

Knobloch-Westerwick, S., Johnson, B. K., & Westerwick, A. (2013). To Your Health: Self-

    Regulation of Health Behavior Through Selective Exposure to Online Health Messages.

    Journal of Communication, (63), 807-829.

    Knobloch-Westerwick, S., Johnson, B. K., & Westerwick, A. (2015). Confirmation bias

    in online searches: Impacts of selective exposure before an election on political attitude

    strength and shifts. *Journal of Computer-Mediated Communication, 20*, 171-187.

Knobloch-Westerwick, S., & Kleinman, S. B. (2012). Preelection selective exposure:

    Confirmation bias versus informational utility. *Communication Research, 39*(2), 170–

    193. doi: 10.1177/0093650211400597

Knobloch-Westerwick, S., & Sarge, M. A. (2015). Impacts of exemplification and efficacy as

    characteristics of an online weight loss message on selective exposure and subsequent

    weight loss behavior. *Communication Research*, *42*, 547-568.

Kreuter, M. W., & Wray, R. J. (2013). Tailored and targeted health communication: Strategies

    for enhancing information relevance. *American Journal of Health Behavior, 27*(3), S227-

    S232.

Lee, N. R., & Kotler, P. (2011). *Social marketing: Influencing behaviors for good.* Los Angeles,

    CA: Sage Publications Inc.

Lowry, R., Gulauska, D. A., Fulton, J. E., Wechsler, H., Kann, L., & Collins, J. L. (2000).

    Physical activity, food choice, and weight management practices among US college

    students. *American Journal of Preventive Medicine, 18*, 18–27.

Markland, D. & Ingledew, D.K. (1997). The measurement of exercise motives: Factorial validity

    and invariance across gender of a revised Exercise Motivations Inventory. *British Journal*

    of Health Psychology, 2, 361-376.

Meyerowitz B. E., & Chaiken, S. (1987). The effect of message framing on breast self-examination attitudes, intentions, and behavior. *Journal of Personality Social Psychology, 52,* 500–510.

Morris, K. L., Cooper, D. P., Goldenberg, J. L., Arndt, J., & Gibbons F. X. (2014). Improving the efficacy of appearance-based sun exposure interventions with the terror management health model. *Psychology Health, 29*(11), 1245–1264.

Morry, M. M., & Staska, S. L. (2001). Magazine exposure: Internalization, self-objectification, eating attitude, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science, 33*, 269–279.

Motl, R. W. & Snook, E. M. (2008). Physical activity, self-efficacy, and quality of life in multiple sclerosis. *Annals of Behavioral Medicine, 35*, 111.

Murray-Johnson, L. & Witte, K. (2003). Looking toward the future: Health message design strategies. In T. Thompson, A. Dorsey, K. Millerand, & R. Parrott (Eds.), *Handbook of Health Communication*. Mahwah, NJ: Lawrence Erlbaum

Nan, X. (2007). The relative persuasive effect of gain- versus loss-framed messages: Exploring the moderating role of the desirability of end-states. *Journal of Mass Communication Quarterly. 84,* 509–524.

Naughton, P., McCarthy, S. N., & McCarthy, M. B. (2015). The creation of a healthy eating motivation score and its association with food choice and physical activity in a cross sectional sample of Irish adults. *International Journal of Behavioral Nutrition and Physical Activity, 12*(74).

Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body

shame, and disordered eating. *Psychology of Women Quarterly*, *22*, 623–636.

doi:10.1111/j.1471-6402.1998.tb00181.x

O'Keefe, D.J., & Jensen, J.D. (2007). The relative persuasiveness of gain-framed and loss

framed messages for encouraging disease prevention behaviors: A meta-analysis review.

Journal of Health Communication, 12, 623–644.

Olivardia, R., Pope, H. G., Borowiecki, J. J., & Cohane, G. H. (2004). Biceps and body image:

The relationship between muscularity and selfesteem, depression, and eating disorder

symptoms. *Psychology of Men & Masculinity, 5*, 112–120.

Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by

enhancing message-relevant cognitive responses. *Journal of Personality and Social

Psychology, 37*(10), 19150-1926.

Pinkley, R. L., Griffith, T. L., & Northcraft, G. B. (1995). "Fixed pie" a la mode: Information

availability, information processing, and the negotiation of suboptimal agreements.

Organizational Behavior and Human Decision Processes, 62, 101-112.

Puoane, T., Fourie, J. M., Shapiro M., Rosling L., & Tshaka, N. C. (2015). 'Big is beautiful'-an

exploration with urban black community health workers in a South African township.

South African Journal of Clinical Nutrition, 18(1), 8–15.

Puoane, T., Tsolekile, L., & Steyn, N. (2010). Perceptions about body image and sizes among

black African girls living in Cape Town. *Ethnicity & Disease, 20*, 29–34.

Rosen, C. S. (2000). Integrating stage and continuum models to explain processing of exercise

messages and exercise initiation among sedentary college students. *Health Psychology,

19*(2), 172-180.

Rothman, A. J., Baldwin, A. S., Hertel, A. W., & Fugelstad, P. T. (2011). Self-regulation and behavior change: Disentangling behavioral initiation and behavioral maintenance. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2nd ed., pp. 106–122). New York, NY: Guilford Press.

Rothman A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: the role of message framing. *Psychology Bulletin, 121*(3).

Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*, *49*(1), 103–122.

Schneider, S. L., Levin, I. P., & Gaeth, G. (1995). *The three faces of framing: A typology of framing effects*. Paper presented at the 36th Annual Meeting of the Psychonomic Society, Los Angeles, California, November.

Schwartz, J. P., Grammas, D. L., Sutherland, R. J., Siffert, K. J., & Bush-King, I. (2010). Masculine gender roles and differentiation: Predictors of body image and self-objectification in men. *Psychology of Men & Masculinity, 11*(3), 208-224.

Schweiger, S., Oeberst, A., & Cress, U. (2014). Confirmation bias in web-based search: A randomized online study on the effects of expert information and social tags on information search and evaluation. *Journal of Medical Internet Research, 16*(3): e94.

Sears, D. O., & Freedman, J. L. (1967). Selective exposure to information: A critical review. Public Opinion Quarterly, 31, 194–213. doi: 10.1086/267513

Senekal, M., Steyn, N. P., Mashego, T. B., & Nel, J. H. (2010). Evaluation of body shape, eating disorders and weight management related parameters in black female students of rural and urban origins. *S Afr J Psych, 31*(1), 45–53.

Simpson, C. C., & Mazzeo, S. E. (2016). Skinny is not enough: A content analysis of fitspiration on Pinterest. *Health Communication, 32*(5), 560-567.

Slater, A., & Tiggemann, M. (2016). Little girls in a grown up world: Exposure to sexualized media, internalization of sexualization messages, and body image in 6-9 year old girls. *Body Image,* 18, 19-22. http://dx.doi.org/10.1016/j.bodyim.2016.04.004

Tiggemann, M., & Willianson, S. (2000). The effect of exercise on body satisfaction and self-esteem as a function of gender and age. *Sex Roles, 43,* 119-127.

Tylka, T. I., & Sublich, L. M. (2002). Exploring young women's perceptions of the effectiveness and safety of maladaptive weight control techniques. J*ournal of Counseling and Development, 20,* 101–110.

Vadeboncoeur, C., Townsend, N., & Foster, C. (2015). A meta-analysis of weight gain in first year university students: is freshman 15 a myth? *BMC Obesity, 2*(2).

Veerman, J., Barendregt, J., van Beeck, E., Seidell, J., & Mackenbach, J. (2007). Stemming the obesity epidemic: a tantalizing prospect. *Obesity, 15*, 2365-2370.

Walls, H. L., Peeters, A., Proietto, J., & McNeil, J. J. (2011). Public Health Campaigns and Obesity - A critique. *BMC Public Health, 11*(136).

Wansink, B., & Pope. (2015). When do gain-framed health messages work better than fear appeals? *Nutrition Reviews, 73*(1), 4-11.

Wason, P. C. (1968). Reasoning about a rule. *Quarterly Journal of Experimental Psychology, 20,* 273-281.

Westerwick, A., S., Johnson, B. K., & Knobloch-Westerwick. (2017). Change Your Ways: Fostering Health Attitudes Toward Change Through Selective Exposure to Online Health Messages. *Health Communication, 32*(5), 639-649. doi:10.1080/10410236.2016.1160319

Wharton, C. M., Adams, T., & Hampl, J. S. (2008). Weight loss practices and body weight

    perceptions among U.S. college students. *Journal of American College Health, 56*(5),

    579-584. doi: 10.3200/JACH.56.5.579-584

Wicks, R. H., Wicks, J. L., & Morimoto, S. A. (2014). Partisan media selective exposure during

    the 2012 presidential election. *American Behavioral Scientist, 58*(9), 1131-1143.

Wimmer, R. D., & Dominick, J. R. (2014). Mass media research: An introduction. Boston, MA:

    Wadsworth, Cengage Learning

Young, D. G., & Anderson, K. (2017). Media diet homogeneity in a fragmented media

    landscape. *Atlantic Journal of Communication, 25*(1), 33-47.

Zillmann, D. (1985). The experimental exploration of gratifications from media entertainment. In

    K. E. Rosengren, L. A. Wenner, & P. Palmgreen (Eds.), *Media gratifications research:*

    Current perspectives (pp. 225-239). Beverly Hills, CA: Sage.

Zillmann, D., & Bryant, J. (1985). *Selective exposure to communication.* Hillsdale, NJ: Lawrence

    Erlbaum Associates.

Appendix A: In-Person Recruitment Script

Hi everyone! My name is Jesse Grace and I am a masters student here in the Journalism and Media Communication department.

I'm here to offer you an opportunity to get some extra credit for this class by taking my survey. The survey is about exercise and nutrition attitudes and will be completely confidential. It will take around 15 minutes and you do not have to exercise or follow any eating regimen to take it.

If you choose to take the survey, your responses will contribute to the creation of health messages that encourage people to adopt healthy behaviors. You will also get _ extra credit points.

I will be sending an invitation and personalized link to access the survey to everyone's CSU Rams email account later today. You will have until March 9th to take the survey and receive the extra credit. Your responses are extremely valuable.

If you do not want to participate in research, you have the option to complete an alternative assignment for the same amount of extra credit. It will also be due on March 9th.

If you have any questions please don't hesitate to contact me, my email is jesse.grace@colostate.edu.

Thank you for your time!

Appendix B: Recruitment PowerPoint Slide

<div style="border:1px solid black; padding:1em;">

Extra Credit Opportunity!

- Take a short survey on your exercise behaviors and attitudes

- Your will get an email with a link later today

    - Subject line: JTC/MKT Extra Credit Survey

- Email jesse.grace@colostate.edu with any questions

- You have until March 9th to take it!

If you do not want to participate in the research, please contact Jesse

</div>

Appendix C: Invitation Email

Subject Line: [class code, e.g., JTC 211] Extra Credit Survey Reminder

Dear (Student Name),

I recently came to your class and sent you an email invitation to take a survey on exercise attitudes and behaviors. Some of your classmates have already taken the approximately 15 minute survey, and I wouldn't want you to miss out on the extra credit opportunity.

Your responses will make a valuable contribution to my research on how to create more effective health messages that encourage people to adopt healthy behaviors.

Your unique link to the survey will work until the end of March 9th: [URL]
Feel free to contact me with any questions, concerns, or problems by emailing me at
jesse.grace@colostate.edu or by replying to this email.

Thank you again for your time!

Jesse Grace
Masters Student
Journalism and Media Communication
Colorado State University

Appendix D: Reminder Email

Subject Line: [class code, e.g., JTC 211] Final Reminder

Dear (Student Name),

I noticed that you have not yet completed the extra credit survey on exercise behavior and attitudes. I wouldn't want you to miss out on your chance to receive extra credit and wanted to reach out one last time to remind you of the survey closing date.

This is a final reminder that you only have until midnight tomorrow (March 9th) to complete the survey.

Here is your unique access link: [URL]
Feel free to contact me with any questions, concerns, or problems by emailing me at jesse.grace@colostate.edu or by replying to this email.

Thank you for your time,

Jesse Grace
Masters Student
Journalism and Media Communication
Colorado State University

Appendix E: Exercise Frequency Questions - Modified IPAQ and Athlete Questions

The following questions are about the **kinds of physical activity you do** in your everyday life. Please answer each question even if you do not consider yourself to be an active person.

Think about the time you spent **walking** in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

During the last 7 days, on how many days did you walk for at least **10 minutes** at a time?
_____ (Drop down response list)

If you answered 1 or more above, how much time on average did you spend **walking** on those days?
_____(Drop down response list)

During the last 7 days, on how many days did you do **moderate** physical activities?

Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal, like gardening, cleaning, bicycling or swimming at a regular pace, or other fitness activities.

Think only about those physical activities that you did for at least **10 minutes** at a time. Do not include walking.
_____ (Drop down response list)

If you answered 1 or more above, how much time did you spend on average doing **moderate** physical activities on those days?
_____ (Drop down response list)

During the last 7 days, on how many days did you do **vigorous** physical activities?

Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal, like heavy lifting, heavier garden or construction work, chopping wood, aerobics, jogging/running or fast bicycling or swimming?

Think only about those physical activities that you did for at least **10 minutes** at a time.
_____ (Drop down response list)

If you answered 1 or more above, how much time did you spend on average doing **vigorous** physical activities on those days?
_____ (Drop down response list)

Are you **currently** a competitive athlete? (e.g., student-athlete, on a club team, or outside of the university)

○ Yes - Please enter sport _____

○ No

Were you a **previously** a competitive athlete?
Only respond yes if it was during high school or more recently (e.g., a school team, league team, etc.) **not** including middle and elementary school.

○ Yes - Please enter sport _____

○ No

Important
The following questions on this page are about how you choose what to eat on a daily basis.
There are no right or wrong answers, so please respond as truthfully as possible
 It is important that the food I eat...

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
Contains vitamins and minerals	○	○	○	○	○	○
Is nutritious	○	○	○	○	○	○
Helps me control my weight	○	○	○	○	○	○
Is good for my body	○	○	○	○	○	○

To what extent are the following statements true/untrue for **you personally?**

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
I always follow a healthy and balanced diet	○	○	○	○	○	○

To what extent are the following statements true/untrue for **you personally?**

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
I eat what I like and I do not worry about the healthiness of food	○	○	○	○	○	○
The healthiness of food has little impact on my food choices	○	○	○	○	○	○
It is more important that my food tastes good than whether or not it is healthy	○	○	○	○	○	○
I get confused about which foods are healthy and which aren't	○	○	○	○	○	○

Appendix G: Exercise Attitudes

The questions on this page are about how you personally feel about exercising.

Whether you exercise regularly or not, to what extent do you agree/disagree that exercising regularly would be _____ for you personally.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Useful	○	○	○	○	○	○	○
Wise	○	○	○	○	○	○	○
Beneficial	○	○	○	○	○	○	○
Enjoyable	○	○	○	○	○	○	○
Interesting	○	○	○	○	○	○	○
Relaxing	○	○	○	○	○	○	○

Appendix H: Healthy Nutrition Attitudes

The following questions are about how you feel about eating healthy food.

Whether you eat healthy food or not, to what extent do you agree/disagree that **eating healthy food** would be _____ for you personally.

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Useful	○	○	○	○	○	○	○
Wise	○	○	○	○	○	○	○
Beneficial	○	○	○	○	○	○	○
Enjoyable	○	○	○	○	○	○	○
Interesting	○	○	○	○	○	○	○

To what extent do you agree/disagree with the following statement?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
The tastiest foods are the ones that are bad for you	○	○	○	○	○	○	○

Appendix I: Appearance Motivations for Exercise

The questions on this page are about what motivates you (or would motivate you) to exercise.

Personally, I **exercise** (or might exercise)....

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
To stay slim	○	○	○	○	○	○
To have a good body	○	○	○	○	○	○
To help me look younger	○	○	○	○	○	○
To improve my appearance	○	○	○	○	○	○
To look more attractive	○	○	○	○	○	○
To improve the appearance of my muscles	○	○	○	○	○	○

Appendix J: Health Motivations for Exercise

Personally, I **exercise** (or might exercise)....

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
To avoid ill-health	○	○	○	○	○	○
To have a healthy body	○	○	○	○	○	○
To prevent health problems	○	○	○	○	○	○
To prevent chronic illnesses	○	○	○	○	○	○
To avoid heart disease	○	○	○	○	○	○
To maintain good health	○	○	○	○	○	○

Answer the following honestly based on your personal motivations.
There is no right or wrong answer and your answers are anonymous.

Which of the following most motivates (or would motivate) you to **exercise**?

	1	2	3	4	5	6	
To maintain my looks	○	○	○	○	○	○	To maintain my health
To improve my appearance	○	○	○	○	○	○	To improve my health
To have a good looking body	○	○	○	○	○	○	To have a healthy body

Appendix L: Appearance Motivations for Healthy Nutrition

Please respond to the following whether you eat healthy food or not.
The following questions are about what does (or would) **motivate** you to eat healthy food.

I eat healthy food (or might eat healthy food) to ...

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
Stay slim	○	○	○	○	○	○
Have a good body	○	○	○	○	○	○
Look younger	○	○	○	○	○	○
Improve my appearance	○	○	○	○	○	○
Look more attractive	○	○	○	○	○	○
Improve my physique	○	○	○	○	○	○

Appendix M: Health Motivations for Healthy Nutrition

I eat healthy food (or might eat healthy food) to ...

	Very true for me	True for me	Somewhat true for me	Somewhat untrue for me	Untrue for me	Very untrue for me
Avoid ill-health	○	○	○	○	○	○
Have a healthy body	○	○	○	○	○	○
Prevent health problems	○	○	○	○	○	○
Prevent chronic illnesses	○	○	○	○	○	○
Maintain good health	○	○	○	○	○	○

Appendix N: Appearance vs. Health Motivations for Healthy Nutrition

Which of the following most motivates (or would motivate) you to eat healthy food?

	1	2	3	4	5	6	
To maintain my looks	◯	◯	◯	◯	◯	◯	To maintain my health
To improve my appearance	◯	◯	◯	◯	◯	◯	To improve my health
To have a good looking body	◯	◯	◯	◯	◯	◯	To have a healthy body

Exercise Article Section:

Instructions

The researchers would like to know what you are interested in. Click on whichever article below seems <u>most interesting to you personally</u> - there is no right or wrong answer. <u>Browse</u> through the articles staying on each article for as long or short as you like, <u>behaving as you would if you found them on a website</u>. You may browse through as many or as few as you wish.

You may return to the list of articles page by using the button that says "return to article list." You may proceed once you are done reading the articles you wanted to.

- EXERCISE ARTICLES YOU MIGHT LIKE -

6 ways **Being Inactive** Worsens Your **Health**	6 ways **Being Active** Improves Your **Appearance**	6 ways **Being Inactive** Worsens Your **Appearance**	6 ways **Being Active** Improves Your **Health**

Appendix P: Healthy Nutrition Stimuli First Page

Nutrition Article Section:

<p style="color:red">Instructions</p>

The researchers would like to know what you are interested in. Click on whichever article below seems most interesting to you personally - there is no right or wrong answer. Browse through the articles staying on each article for as long or short as you like, behaving as you would if you found them on a website. You may browse through as many or as few as you wish.

You may return to the list of articles page by using the button that says "return to article list." You may proceed once you are done reading the articles you wanted to.

- NUTRITION ARTICLES YOU MIGHT LIKE -

6 ways	6 ways	6 ways	6 ways
What You Eat Can **Worsen** Your **Health**	What You Eat Can **Improve** Your **Appearance**	What You Eat Can **Improve** Your **Health**	What You Eat Can **Worsen** Your **Appearance**

6 Ways Being Active Improves Your Appearance

Being physically active isn't just about getting healthy and staying in shape. Regular exercise will actually improve your appearance in ways that go far beyond improving how your body functions. So lace up those sneakers, or unfurl that yoga mat, because here are 6 ways how being active will have you looking your best in no time.

1. **Heal dry skin and acne**: Whether you have oily or dry skin, exercise will help. Sweating helps hydrate dry skin and clears out your pores if you have oily skin. Sweat also contains a natural antibiotic that fights certain bacteria - bacteria are one of the causes of acne. Just be sure to wash your face right after working out to prevent dirt and bacteria from building up in your pores.
2. **Increase attractiveness**: Studies have found that even when they didn't lose weight, people who exercise regularly are perceived as more attractive than people who don't exercise regularly. There's the clearer skin, toned physique, and confidence boost that comes with exercise. However, even if you put cultural beauty standards aside, your looks are a representation of your overall health.
3. **Sexier smile - Better teeth:** Various studies have found that people who exercise have better oral health and are less likely to develop gum disease than people who don't exercise. A smile is like a peacock's tail – it's a big part of what makes you attractive to a mate. So add a few squats to your daily brushing routine.
4. **Delay wrinkles**: Regular physical activity actually keeps you looking young for longer. Being active can reduce signs of aging, such as wrinkles. You might not be concerned about this yet, but exercising now will keep your skin wrinkle free when you're your parents' age.
5. **Appear taller**: You may have thought you were done growing, but think again. Light-weight resistance training, such as yoga, Pilates, or even swimming, leave you with long, lean muscles and improve your posture (which is associated with attractiveness). So you may not technically be growing but you will look taller.
6. **Hair health and growth:** Exercising brings fresh nutrients to your scalp through improved circulation. Exercise also helps regulate hormones, such as cortisol - high levels of cortisol can lead to hair loss.

You don't need to spend hours at the gym every day on boring machines to reap the benefits. Just **30 minutes a day** of moderate physical activity can help you look your best. Find what works for you, whether that is yoga, intense interval training, or following the latest Instagram home fitness routine. If you're moving, your looks are improving.

6 Ways Being Inactive Worsens Your Appearance

By being physically inactive, you aren't just missing out on good health and being in shape. Not exercising regularly will actually make your appearance worse in ways that go beyond having decreased body function. So if you don't lace up those sneakers, or unfurl a yoga mat, you are preventing yourself from looking your best. Here are 6 ways how being inactive worsens your appearance.

1. **Dry skin and acne**: Whether you have oily or dry skin, lack of exercise is not helping. When you don't sweat, dry skin becomes more dehydrated and pores in oily skin remain blocked. If you don't sweat, you're also missing out on the natural antibiotics in sweat that help fight acne-causing bacteria.
2. **Less attractive**: Studies have found that even if they didn't gain weight, people were perceived as less attractive when they didn't exercise regularly compared to when they did. By being inactive, you're losing out on the clearer skin, toned physique, and confidence boost that comes with exercise. Even with cultural beauty standards aside, your looks are a representation of your overall health.
3. **Scarier smile - Bad teeth:** Various studies have found that people who don't exercise have worse oral health and are more likely to develop gum disease than people who do exercise. A smile is like a peacock's tail – it's a big part of what makes you attractive to a mate. So if you don't add exercise to your daily brushing routine, you aren't doing enough to help your smile
4. **Early wrinkles**: Being inactive actually makes you age faster and increases signs of aging such as wrinkles. You might not be concerned about this yet, but if you don't exercise now, you'll have more wrinkles when you're your parents' age.
5. **Appear shorter:** You may have thought you were going to be this height for the rest of your life, but think again. If you don't do light-weight resistance training, such as yoga, Pilates, or even swimming, you won't have long, lean muscles, but you will have worse posture (good posture is associated with attractiveness). So you may not technically be shrinking, but you will look shorter.
6. **Hair loss and weakness**: Not exercising deprives the scalp of fresh nutrients due to decreased circulation. Not exercising may also lead to higher levels of cortisol, and high levels of cortisol can lead to hair loss.

If you don't spend hours at the gym every day on boring machines it doesn't mean your looks will get worse. Just **30 minutes a day** of moderate physical activity can help you look your best. Find what works for you, whether that is yoga, intense interval training, or following the latest Instagram home fitness routine. If you're not moving, your looks are suffering.

6 Ways Being Active Improves Your Health

Being physically active isn't just about looking better and losing weight. Regular exercise will actually improve your health in ways that go beyond improving your appearance. So lace up those sneakers, or unfurl that yoga mat, because here are 6 ways how being active will have you at your healthiest in no time.

1. **Better sleep**: Exercise not only reduces stress, which leads to better sleep, it also improves circadian rhythms. In other words, it makes you more alert during the day and can help you sleep at night. Some people feel more awake after a workout, whereas others feel exhausted and just want to go to bed. Find a time to exercise that's best for you. Either way, your sleep will be improved.
2. **More energy:** It seems strange that exercise would give you more energy, but the results are undeniable. Multiple studies have found that exercise is more effective at boosting energy levels than energy drinks. Even people with cancer and chronic conditions that cause fatigue experienced higher energy levels when they exercised regularly.
3. **Live longer**: Being physically active can slow the aging process. Scientists have figured out how this happens: chromosomes get shorter when cells divide, which causes aging. Essentially, exercise adds NRF1, a coating like a fingernail varnish, to chromosomes, protecting them from getting shorter.
4. **Stronger bones**: Weight-bearing physical activity makes your muscles push and tug against your bones. This pushing and tugging increases bone density, so you're less likely to break bones or develop osteoporosis in your later years. If you hate lifting weights, you have other options; yoga, Pilates, and body-weight strength exercises can increase bone density.
5. **Treatment (and prevention) of chronic health problems**: You may have heard that being active reduces risks of health problems like cardiovascular disease later in life, but doctors have also started prescribing exercise as a treatment for diseases. It can actually ease symptoms of arthritis and reduce pain. Regular exercise can reverse conditions such as type 2 diabetes and it can help treat high-blood pressure. If you have a health issue, consult your doctor and an exercise specialist before getting started.
6. **Fights off colds and flu:** Research shows that people who engage in regular moderate exercise get fewer colds than those who don't. Exercise can boost your immune system by increasing your white blood cells, so it makes sense that people who move more get sick less.

You don't need to spend hours at the gym every day on boring machines to reap the benefits. Just **30 minutes a day** of moderate physical activity can help you be your healthiest. Find what works for you, whether that is yoga, intense interval training, or following the latest Instagram home fitness routine. If you're moving, your health is improving.

6 Ways Being Inactive Worsens Your Health

By being physically inactive you aren't just missing out on looking better and losing weight. Lack of exercise will actually worsen your heath in ways that go beyond worsening your appearance. So if you don't lace up those sneakers, or unfurl a yoga mat, you are preventing yourself from achieving good health. Here are 6 ways how being inactive worsens your health.

1. **Worse sleep**: People who don't exercise are not only more stressed than people who do, they also are likely to have disrupted circadian rhythms. In other words, it makes you less alert during the day and can disrupt your sleep at night. Either way, if you don't exercise, your sleep is affected negatively.
2. **Less energy**: It seems strange that being inactive leads to less energy, but the results are undeniable. Even people with cancer and chronic conditions that cause fatigue who didn't exercise experienced lower energy levels than similar people who did exercise.
3. **Shorten your life**: Being inactive can speed up the aging process. Scientists have figured out how this happens: chromosomes get shorter when cells divide, which causes aging. Essentially, exercise adds NRF1, a coating like a fingernail varnish, to chromosomes, protecting them from getting shorter.
4. **Weaker bones**: If you don't do weight-bearing physical activity, your muscles don't push and tug against your bones as much as they should. This pushing and tugging against your bones increases bone density. So if you don't exercise, you are more likely to break bones and develop osteoporosis in your later years. If you hate lifting weights, you have other options to increase bone density such as, yoga, Pilates, and body-weight strength exercises.
5. **Increased risk and symptoms of chronic diseases and health problems**: You may have heard that being inactive increases your risk of developing health problems. Doctors have also started prescribing exercise as a treatment for diseases. It can actually ease symptoms of arthritis, reverse type 2 diabetes, and lower your blood pressure. If you have a health issue, consult your doctor and an exercise specialist before getting started.
6. **Increased risk of colds and flu:** Research shows that people who don't engage in regular moderate exercise get more colds than those who do. Exercise can boost your immune system and increase white blood cells, so it makes sense that people who move less get sick more.

If you don't spend hours at the gym every day on boring machines it doesn't mean your health will get worse. Just **30 minutes a day** of moderate physical activity can help you be your healthiest. Find what works for you, whether that is yoga, intense interval training, or following the latest Instagram home fitness routine. If you're not moving, your health is suffering.

6 Ways What You Eat Can Improve Your Appearance

Eating healthy food isn't only good for your health and managing your weight. Eating nutrient-dense foods will actually improve your appearance in ways that go far beyond improving how your body functions. Here are 6 ways how eating better food will have you looking your best in no time.

1. **Smooth skin:** Your skin needs essential fats to look its best, so grab a handful of nuts or grill a fish filet to boost your omega-3 and omega-6 fats. Avoiding those additives and unhealthy saturated and trans fats found in fast food helps prevent dry and acne prone skin from becoming more irritated.
2. **Reduce dark circles and puffiness:** Reducing the amount of sodium in your diet can reduce the appearance of dark circles and puffiness. By avoiding prepackaged and processed food, you can drastically cut your daily sodium intake. Eating excess sodium can cause water retention and bloating.
3. **Whiter teeth:** It's no secret that avoiding sugar can help prevent cavities, and healthier, stronger teeth on the inside means your teeth will look whiter on the outside. Look for the number of grams of sugar in your food by examining the nutrition labels. That "healthy" granola bar or smoothie may be loaded with sugar. Reduce sugar and increase calcium (dark green vegetables like kale and broccoli are high in calcium) to keep those pearly whites, well, pearly and white.
4. **Flatter stomach:** Certain foods can cause you to bloat and make your stomach appear rounder than it is. Gas in your digestive tract can cause boating, so the first step to reduce this would be to avoid carbonated drinks. Slowly increasing fiber by eating more fresh fruits and vegetables can help keep your stomach looking flat.
5. **Fuller, stronger hair:** Your hair is made of protein, so by eating lean protein (e.g., meat, eggs, tofu, etc.)**,** your hair will be stronger and grow faster. Iron is also important for hair health, so stock up on those leafy greens. Avoid crash diets, as a sudden drastic drop in calories can lead to hair loss.
6. **Younger for longer:** Your best weapon against wrinkles is not eye cream; it's water. Drinking water hydrates your body and your skin, which prevents premature wrinkles. So keep a bottle of water handy and drink the wrinkles away.

You don't need to start a diet that cuts out all of your favorite foods in order to improve your looks. Start by trading out soda for water at mealtime. Pass on the prepackaged or fast food for lunch and grab those home-cooked leftovers from the night before. These little changes will make a big difference in improving your looks.

6 Ways What You Eat Can Worsen Your Appearance

Avoiding healthy food isn't only bad for your health and your weight. Eating empty calories will actually worsen your appearance in ways that go far beyond deteriorating how your body functions. Here are 6 ways how what you eat can worsen your appearance.

1. **Flaky or bumpy skin:** If you don't eat essential fats, your skin won't look its best. So if you aren't eating nuts and fish, you could be low on omega-3 and omega-6 fats. Also, research shows that additives and unhealthy saturated and trans fats found in fast food irritate dry skin and worsen acne.
2. **Dark circles and puffy eyes:** If you don't avoid sodium in your diet, it can increase the appearance of dark circles and puffiness. If you eat prepackaged and processed food, your sodium levels will increase. Eating excess sodium can also cause water retention and bloating.
3. **Yellow teeth:** It's no secret that eating sugar can cause cavities, and unhealthy, weaker teeth on the inside means your teeth look less white on the outside. If you don't pay attention to how many grams of sugar are in your food, you may be consuming a bunch of extra sugar in that "healthy" granola bar or smoothie. If you don't reduce sugar and eat enough calcium rich foods (e.g., dark green vegetables like kale and broccoli), those pearly whites won't be so pearly and white anymore
4. **Bulging stomach:** Certain foods can cause you to bloat and make your stomach appear rounder than it is. Gas in your digestive tract can cause boating, so drinking carbonated drinks will likely cause a problem. If you don't eat enough fiber found in fresh fruits and vegetables it may also cause your stomach to look rounder than it is. However, fiber needs to be increased gradually to give your body time to adjust.
5. **Thinner, weaker hair:** Your hair is made of protein, so by not eating enough lean protein (e.g., meat, eggs, tofu, etc.)**,** your hair will start to thin and growth will slow. Not including iron in your diet can also hurt hair health; passing on the leafy greens can be bad for your hair. Crash diets that drastically reduce calories can also lead to hair loss.
6. **Losing your youth:** Not drinking enough water will worsen the appearance of wrinkles, no matter how much eye cream you use. Not drinking enough water dehydrates your body and skin, which can lead to premature wrinkles. So if you don't keep a bottle of water handy, the wrinkles will creep in faster than you think.

You don't have to start a diet that cuts out all of your favorite food. Start by trading out soda for water at mealtime. Pass on the prepackaged or fast food for lunch and grab those home-cooked leftovers from the night before. If you don't make these little changes, your looks will suffer.

6 Ways What You Eat Can Improve Your Health

Eating healthy food isn't only good for your looks and managing your weight. Eating more nutrient-dense foods will actually improve your health in ways that go far beyond improving how your body looks. Here are 6 ways how eating better food will have you at your healthiest in no time.

1. **Better sleep:** The food you eat during the day can help you sleep better at night, and its not just about cutting caffeine in the afternoon and before bedtime. Starting with a good breakfast consisting of protein and complex carbs as well as eating nutrient-dense food every few hours can help regulate your body's hormone levels and lead to a better night's sleep.
2. **Avoid colds and flu:** Vitamin C isn't the only thing you should consume more of to keep your immune system in tip-top shape. Omega-3s from salmon, antioxidants in blueberries, and the active cultures in yogurt all help boost your ability to fight illness.
3. **More energy:** Saying no to sugar and choosing to eat complex carbs and protein instead (whole grains and lean meats) will give you sustained energy. You may think that sugar will give you an energy boost, but it causes a rapid spike in blood sugar, which leads to a rapid drop in blood sugar and can cause an energy crash. Check the labels on your food because that "healthy" yoghurt or energy bar may be loaded with added sugar. Choose low sugar foods to feel energized for longer.
4. **Fewer stomach issues:** Stick to water and avoid carbonated beverages. The gas can cause discomfort in your digestive tract. Also think fresh and not fried. Digesting fatty foods is hard on your system and may be the cause of your upset stomach or acid reflux. This means that minimizing the amount of fast food you eat will help your digestive system function better.
5. **Reduced risk of chronic diseases:** Reducing the salt in your diet will lower your blood pressure and reduce your risk of heart disease. Roughly 90% of Americans consume too much salt. Some people are having heart attacks as early as their 20s and 30s. Eating plenty of fresh fruits and vegetables can reduce your risk of acquiring other chronic diseases such as cancer.
6. **Brain health:** Your brain is about 75% water; so drinking a lot of water keeps your brain functioning at its best. Foods rich in B vitamins (e.g., leafy greens) reduce the risk of dementia, and foods rich in omega-3s (e.g., flaxseed) help with overall brain function and memory.

You don't need to start a diet that cuts out all of your favorite foods in order to be healthy. Start by trading out soda for water at mealtime. Pass on the prepackaged or fast food for lunch and grab those home-cooked leftovers from the night before. These little changes will make a big difference in improving your health.

6 Ways What You Eat Can Worsen Your Health

Avoiding healthy food isn't only bad for your looks and managing your weight; eating empty calories will actually worsen your health in ways that go far beyond deteriorating how your body looks. Here are 6 ways how what you eat can worsen your health.

1. **Worse sleep**: The food you eat during the day can lead to a worse night's sleep, and it's not just about cutting caffeine in the afternoon and before bedtime. If you don't start with a good breakfast that has protein and complex carbs, or eat something rich in nutrients every few hours, your body's hormones aren't as well balanced which can lead to a restless night.
2. **Colds and flu**: Without sufficient Vitamin C, your immune system won't be in tiptop shape, but it's not the only nutrient you need for immune health. If you aren't eating omega-3s (e.g., salmon), antioxidants (e.g., blueberries), and active cultures (e.g., yogurt), you have increased risk of catching an illness during cold and flu season.
3. **Less energy:** Eating a sugary snack to boost energy can do more harm than help as sugar causes a rapid spike in blood sugar, followed by a rapid drop in blood sugar which leads to an energy crash. If you don't check the labels on your food, you're probably consuming way too much sugar in that "healthy" yoghurt or energy bar. If you choose sugar over complex carbs and protein (e.g., whole grains and lean meats), you won't have sustained energy.
4. **Stomach issues:** If you don't drink enough water and choose carbonated beverages instead, the gas can cause discomfort in your digestive tract. If you are choosing fried or fast food over fresh, digesting the fatty foods is very hard on your system and may be the cause of your upset stomach or acid reflux.
5. **Increased risk of chronic diseases:** If you don't reduce your salt intake, you will likely have higher blood pressure and have a higher chance of getting heart disease. Roughly 90% of Americans consume too much salt, and some people are having heart attacks as early as their 20s and 30s. Risks of acquiring other chronic diseases, such as cancer, also increase if you don't eat plenty of fresh fruits and vegetables.
6. **Unhealthy brain:** Your brain is about 75% water, so if you aren't drinking enough water, your brain can't function as well as it should. If you don't eat foods rich in B vitamins (e.g., leafy greens) and omega-3s (e.g., flaxseed), your risks of acquiring dementia are higher and you aren't helping your overall brain function and memory.

You don't have to start a diet that cuts out all of your favorite food; start small by trading out soda for water at mealtime. Pass on the prepackaged or fast food for lunch and grab those home-cooked leftovers from the night before. If you don't make these little changes, your health will suffer.
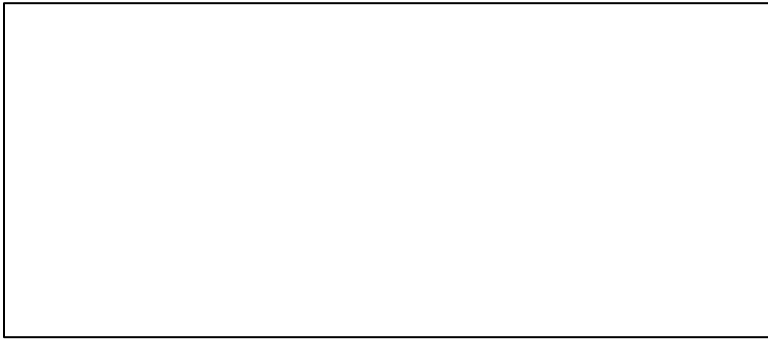
Appendix Y: Open-Ended Article Selection Questions

We are interested in why you chose the articles you did.

I selected the following exercise article first because...

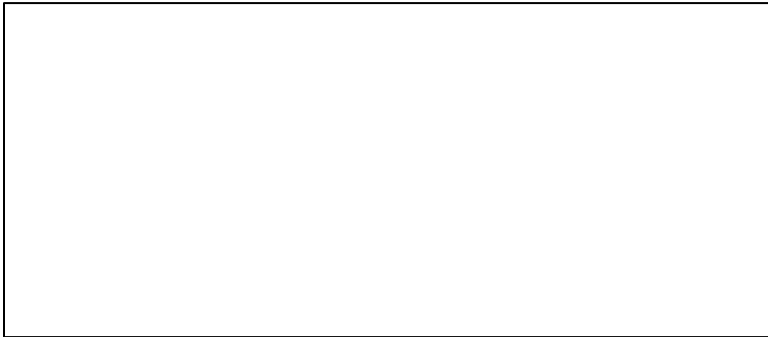6 ways
Being **Active**
Improves Your
Appearance

We are interested in why you chose the articles you did.

I selected the following nutrition article first because…

6 ways
What You
Eat Can **Improve**
Your **Health**

Appendix Z: Demographic Questions

With which gender do you identify?

○ Female

○ Male

○ Non-binary/third gender

○ Prefer to self-describe: _____

○ Prefer not to respond.

What is your race/ethnicity. If you are of mixed descent, you may select multiple options.

☐ Asian / Pacific Islander

☐ Black or African American

☐ Hispanic or Latino

☐ Native American or Alaska Native

☐ White

☐ Other _____

What is your birth year? This will only be used for reporting accurate age-related demographics.

_____ yyyy

What is your weight in pounds? If you are unsure, your best guess is fine.

Keep in mind that your responses are not connected to your identity, and while you are not required to answer, your responses are valuable to our research.

_____ lbs

What is your height in feet and inches?

ft

In

Appendix AA: Debriefing Statement

Thank you for participating in the study!
You will receive your extra credit.

Debrief:
The purpose of this study is to see if presenting similar health-related information in different ways may be more appealing to different people depending on their individual characteristics. If you have classmates who have not taken the survey yet, please do not talk to them about the purpose of the study. This may jeopardize our results and the study is very important to us.

Here are some other reliable resources if you would like to find out more information about exercise and nutrition:
https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm
https://www.cdc.gov/healthyweight/losing_weight/eating_habits.html
https://www.choosemyplate.gov/physical-activity
https://www.choosemyplate.gov/dietary-guidelines

Please feel free to contact Jesse at jesse.grace@colostate.edu if you have any questions.