

DISSERTATION

IS THE FRAME THE NAME OF THE GAME?
THE INFLUENCE OF MESSAGE FRAMING ON FITNESS CLASS ATTENDANCE AND
PERFORMANCE

Submitted by

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ABSTRACT

IS THE FRAME THE NAME OF THE GAME? THE INFLUENCE OF MESSAGE FRAMING ON FITNESS CLASS ATTENDANCE AND PERFORMANCE

Despite the inarguable benefits of exercise, less than twenty percent of Americans meet the ACSM's physical activity (PA) recommendations (CDC, 2017). Many interventions have focused on increasing participation in individual PA activity, but inspiring participation in group fitness classes may be more advantageous than promoting individual PA, as group fitness offers the added benefits of social support and accountability (Estabrooks, 2000). This dissertation sought to determine the most effective manner to market group fitness classes by testing the effect of message framing on college students' attendance of a variety of group fitness classes. Furthermore, this study considered the influence that exposure to message framing may have on individuals' mindsets and, specifically, how mindsets induced via message framing may affect individuals' performance in group fitness classes. Therefore, two experiments were conducted to independently examine message framing's effect on individuals' attendance of and experiences during fitness classes.

In experiment 1, 189 participants read descriptions of four different fitness classes – each of which included a different type of message framing (gain vs. loss framing) and different framing content (appearance vs. health outcomes) – and selected one of the four classes to attend. Accordingly, participants read descriptions of four unique classes that featured (1) appearance-related gain framing, (2) appearance-related loss framing, (3) health-related gain

framing, and (4) health-related loss framing. Participants in experiment 1 were required to attend the class of their choosing; upon completion of the class, participants self-reported their enjoyment of and effort in the fitness class they completed.

In experiment 2, 131 participants attended the same fitness class – a 45-minute highly standardized barbell class – and were randomly assigned to one of the four framing conditions included in study 1 (appearance gain, appearance loss, health gain, and health loss) or a control condition that included no framing. Immediately prior to starting the fitness class, participants viewed a class description that included the framing manipulation (i.e., class description featured one of the five framing options). Participants wore an Actigraph accelerometer (i.e., an activity tracker) during the class, allowing for objective assessment of participants' energy expenditure during the class.

In experiment 1, participants overwhelmingly chose to attend classes whose descriptions included appearance-related gains. Likewise, participants were indeed more likely to select gain frames over loss frames. Participants also reported exerting more effort in classes whose descriptions featured gain framing. However, participants' reported enjoyment of classes did not differ by framing condition – i.e., the framing included in the class descriptions did not influence the level of enjoyment participants reported in the four differently-framed classes.

While participants reported exerting more effort in gain-framed classes in experiment 1 (that is, participants *perceived* themselves as exerting more effort in gain-framed classes), participants' objective energy expenditure (i.e., minutes spent in moderate-to-vigorous PA and caloric expenditure, as measured via actigraphy) was not affected by exposure to differently-framed messages in experiment 2. Likewise, participants' self-reported effort did not differ by

framing condition in experiment 2. However, participants exposed to gain-framed descriptions reported greater enjoyment of the fitness class.

This research demonstrated that message framing significantly impacted attendance rates of fitness classes – individuals were significantly more likely to attend classes whose descriptions featured appearance-related gain framing (experiment 1). However, message framing did not produce a clear effect on individuals' performance in these fitness classes, as individuals *reported* exerting more effort in gain-framed classes (experiment 1) but did not *objectively* exert more effort (experiment 2), highlighting the need for additional research in this area to disentangle how message framing may influence individuals' experiences during group fitness classes.

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CHAPTER 1 – INTRODUCTION

General Background

Engaging in regular physical activity is associated with an overwhelming number of physical health benefits including a reduced risk for chronic diseases, increased longevity, enhanced cardiovascular functioning, and improved bone and joint health (US Public Health Service, 1996). Furthermore, physical activity offers numerous benefits for psychological health – e.g., decreased depression and anxiety, reduced stress, and enhanced mood (for review, see Warburton, Whitney-Nicol, & Bredin, 2006). However, despite the irrefutable evidence for the physical and mental health benefits of exercise – and the negative consequences associated with physical inactivity, such as increased morbidity and lowered quality of life (e.g., Kohl et al., 2012) – less than twenty percent of Americans currently meet the physical activity recommendations (a minimum of 30 minutes of moderate aerobic activity five days a week) prescribed by the American College of Sports Medicine (CDC, 2017). Because of the underwhelming level of physical activity in America and the indisputable benefits of engaging in physical activity, promoting physical activity is of the utmost importance so that individuals can reap the benefits associated with regular physical activity and thwart the negative health consequences associated with physical inactivity.

While encouraging physical activity is undeniably beneficial, inspiring actual change in physical activity behavior is dependent in part on the way in which the benefits of physical activity – or costs of physical inactivity – are conveyed. Based on the manner in which a health message (e.g., encouraging individuals to engage in physical activity) is communicated, individuals may be more or less receptive to the message itself. As such, a health message can be

altered to enhance its appeal, utilizing insights from decision-making theories (e.g., Prospect Theory and message framing) to influence how individuals perceive health messages and increase the likelihood that individuals will make decisions to benefit their health.

The present study specifically investigated the impact of message framing for exercise classes specifically and was designed to determine effective tools to market fitness classes by utilizing message framing techniques, uniquely contributing to the existing health decision-making research by testing message framing for structured exercise classes rather than for general physical activity outcomes. Additionally, by considering the influence that message framing may have on individuals' mindsets, this study provided insight as to whether having a particular mindset instilled via exposure to differently-framed messages has an impact on individuals' experiences during fitness classes.

This study had two primary goals – (1) to establish whether message framing influences individuals' attendance of group fitness classes (i.e., to determine if individuals are more likely to attend classes if the class descriptions utilize a particular type of message framing) and (2) to reveal whether message framing influences participants' exercise-related mindsets and, accordingly, impacts their performance during exercise classes. Therefore, two experiments were performed to unearth the impact of message framing on inspiring attendance of – and influencing performance in – group fitness classes.

Health Decision-Making

Prospect Theory

In decision-making, there is a stark contrast between *normative* decision-making theories– i.e., how people *should* make decisions – and *descriptive* decision-making theories – i.e., how people *actually do* make decisions (Treadwell & Lenert, 1999). Kahneman and Tversky

(1979) introduced Prospect Theory as a descriptive theory related to individuals' decision-making under conditions of uncertainty. Originally, Prospect Theory was developed in the context of monetary gambles, however it has since been applied to many different domains that are more “involved” or complex decision-making situations (Treadwell & Lenert).

According to Prospect Theory, there are two phases in the decision-making process – *editing* and *evaluation* (Kahneman & Tversky, 1979). In the initial editing phase of the decision-making process, individuals consider the offered “prospects” and organize relevant information related to these prospects. Within the editing phase, individuals decide which outcomes they consider equivalent, set a reference point, and classify outcomes as either *losses* or *gains* on the basis of the set reference point. During the editing phase, individuals seek to simplify the various prospects and organize information in order to assist them with their subsequent evaluation of these prospects. After the editing phase, individuals engage in the evaluation phase of the decision-making process. During this evaluation phase, individuals consider the merits of each prospect and ultimately choose the prospect that has the highest value.

When an individual is deciding which prospect they should choose in the evaluation phase – taking into consideration the probability of different outcomes and the “weight” of those outcomes – a decision-maker can increase the likelihood of making an optimal choice by maximizing the expected value of a choice (Wickens et al., 2013). However, this process is not as simple or infallible as it may appear, as humans are not objective in their perceptions of costs and benefits when it comes to decision-making and instead rely on *subjective* costs and benefits to conduct their editing and evaluating of prospects. For instance, individuals tend to weigh a loss of a given amount as greater than a gain of the same amount, thereby demonstrating *loss aversion*. Accordingly, a potential loss exerts greater influence on decision-making than a

potential gain of the same amount, as individuals perceive the potential loss as subjectively more consequential than the potential gain. For example, if an individual is given the choice to win \$1 or lose \$1 on the basis of a coin flip (e.g., heads: win \$1, tails: lose \$1), it is unlikely that the individual would choose to participate in the gamble, as the potential \$1 loss is seen as more negative than the potential \$1 gain is seen as positive (Wickens et al., 2013).

Message Framing

While objective losses and gains associated with certain decisions can often not be altered (i.e., certain prospects inherently possess certain outcomes), individuals' perceptions of losses and gains can be manipulated by the manner in which prospects are *framed* (Tversky & Kahneman, 1985). For example, a meat product described as "80 percent lean" will be perceived as more attractive than if it is described as "20 percent fat," even though the product is indeed identical in those two descriptions (Wickens et al., 2013). In this example, the product with the "80 percent lean" framing is considered to have a *positive frame*, because this frame emphasizes the attractive feature of the meat (i.e., its lean content), while the product with the "20 percent fat" description is considered to have a *negative frame* due to the frame's emphasis of the meat's unattractive attribute (i.e., the fat content)

Altering the manner in which prospects are framed influences the *saliency* of particular cues associated with the various choices and induces a shift in reference level (Treadwell & Lenert, 1999). When a prospect is positively framed, the gains associated with that prospect are more salient to a decision maker than the losses associated with that prospect. Likewise, when a prospect is negatively framed, the losses associated with that prospect are more salient than the gains related to that same prospect. In general, individuals are more likely to select a prospect if it is framed positively rather than framed negatively, as a negative frame highlights the

losses/deficiencies associated with a particular prospect, thereby making losses more salient than gains and influencing decision-making accordingly.

Message Framing and Health Decisions

When an individual is making a decision related to their health (e.g., choosing to eat nutritiously or opting to undergo a physical examination), there are a variety of underlying reasons to perform certain actions and abstain from others. As such, there are many cues that individuals rely on when they are gathering information related to particular health actions. On the basis of Prospect Theory, when individuals are making health decisions, they organize relevant information in terms of potential benefits (*gains*) and potential costs (*losses*) compared to a set reference point (which, in the context of health, can be viewed as an individual's present level of health). Utilizing message framing techniques, objectively equivalent information can be presented to individuals such that they perceive it as either a gain or a loss; health messages can be framed in a way that accentuates either the positive benefits of engaging in a particular action (i.e., a *gain frame*) or negative consequences of failing to engage in a particular action (i.e., a *loss frame*) (e.g., Detweiler et al., 1999; Rothman & Salovey, 1997). For example, informing consumers of the health benefits associated with increased physical activity would be a gain-framed message, while alerting consumers of the health consequences associated with failing to engage in regular physical activity would be a loss-framed message.

According to Prospect Theory, individuals differ in their decision-making tendencies when faced with gain-framed prospects and loss-framed prospects – people tend to be *risk seeking* when losses are salient but *risk averse* when gains are salient (Tversky & Kahneman, 1986). For example, if an individual is asked to choose between two prospects – one of which is a sure loss (choice A), and one of which involves a small probability of an even greater loss but

also the large possibility of no loss (choice B) – most people will choose the risky prospect (option B) rather than the sure loss. For example, consider a choice between:

(A) a sure loss of \$750

(B) 75% chance to lose \$1000 and 25% chance to lose nothing

In this instance, Tversky and Kahneman (1986) note the majority of individuals (87% in their sample of college students) opt for the risky prospect (choice B) rather than the sure loss. In fact, individuals are likely to make the risky choice even if option B involves a large probability of a greater loss and a small probability of no loss (compared to accepting the sure loss of option A).

However, if an individual is presented with two different prospects – one of which is a sure gain (option A) and one of which includes a small chance of an even larger gain and a greater chance of no gain (option B) – most people will select the sure gain (option A) rather than taking the riskier option (option B). For example, consider a choice between:

(A) a sure gain of \$240

(B) 25% chance to gain \$1000 and 75% chance to gain nothing

In this case, individuals are far more likely to opt for the sure gain (choice A) rather than choosing the riskier option (Tversky & Kahneman, 1986). Furthermore, when option B contains a large probability of a greater gain and a small probability of no gain, individuals are still likely to select the sure gain rather than chancing the riskier option.

This pattern of risk seeking behavior for choices involving losses and risk aversion for choices involving gains is easily described in choices involving monetary gains or losses (e.g., gambling), and it can also be applied to health-related decisions that involve gains or losses to physical health. Because of tendencies involving risk seeking and risk aversion related to framing effects, Salovey and Williams-Piehota (2004) suggest that when health choices involve

risk or uncertainty, individuals are more likely to take those risks when information is loss-framed – i.e., when the negative consequences of a situation are made salient. Conversely, when health choices involve little risk or uncertainty, individuals are more likely to engage in behaviors when they are gain-framed – emphasizing the positive consequences of a situation (Salovey & Williams-Piehota, 2004).

From a Prospect Theory perspective, the efficacy of a framing technique is dependent in part on the target behavior and the risk associated with that behavior (i.e., gain-framed and loss-framed messages do not inspire action equally well for all behavioral objectives). According to Rothman and Salovey (1997), *detection* behaviors (those aimed at identifying the existence of a potential health problem – e.g., electing to complete a mammography exam or undergo a Pap test) are more effectively promoted through loss framing, as there is a perceived risk associated with performing detection behaviors. Although detection behaviors are indeed performed to mitigate long-term risk (e.g., detecting a disease in the early stages when the prognosis is much better compared to later diagnoses), the perceived short-term risk of performing detection behaviors is quite large (e.g., discovering the presence of a tumor or other abnormality). As most individuals opt to maximize short-term gains and minimize short-term risks (Herrnstein, 1990), the long-term benefits of detection behaviors do not adequately counteract the short-term risks, thereby making individuals less likely to perform detection behaviors if they are gain-framed.

While loss framing is effective at promoting detection behaviors, *prevention* behaviors (i.e., actions that aim to thwart the onset of a health problem, such as wearing a seatbelt or applying sunscreen) are better promoted with gain framing (Rothman & Salovey, 1997). While detection behaviors possess short-term risks, prevention behaviors are not viewed as risky; in fact, preventative health behaviors are designed to minimize both short-term and long-term risk

(e.g., reduce the likelihood of getting in an accident or contracting a disease). Because prevention behaviors themselves do not involve risks, gain-framed messages tend to be more successful for prevention behaviors, as individuals tend to be risk-averse in the domain of gains, as discussed previously.

In the context of health behaviors, the efficacy of loss and gain framing appears to be dependent on the target behavior and the (short-term) risk associated with performing that behavior. Block and Keller (1995) suggest that based on the perceived risk or benefit associated with performing an action (or failing to perform an action), individuals process and internalize gain-framed and loss-framed messages differently. For behaviors with low efficacy (i.e., if it is uncertain that performing an action will lead to the desired outcome), individuals are more motivated to engage in in-depth processing. Furthermore, when individuals process messages in-depth, negatively framed messages are more persuasive than their positively framed equivalents. Conversely, when behaviors are viewed as highly efficacious (i.e., if it is certain that performing an action will lead to the desired outcome), individuals are less motivated to process messages in-depth and positively framed messages are more advantageous for inspiring change. On the basis of differing levels of processing, prevention behaviors (which are typically viewed as high efficacy actions) are likely to be processed at a lower level (i.e., less in-depth); thus, a gain-framed appeal is more likely to influence attitudes and, in turn, inspire changes in behavior for prevention behaviors. However, messages related to detection behaviors are more likely to be carefully processed. Therefore, loss-framed messages are more likely to leading to increased behavioral intentions for detection behaviors (Block & Keller, 1995).

Message Framing and Physical Activity

While physical activity is typically classified as a prevention behavior (i.e., individuals

regularly exercise to *prevent* the development of health problems), individuals who have already *detected* health consequences associated with physical inactivity could use physical activity to improve their health. Therefore, the distinction between prevention and detection can be a bit murkier for physical activity compared to other health behaviors. Because of this, a number of studies have been conducted to determine the most effective framing strategy to aid in physical activity promotion.

Guided by Rothman and Salovey's framework, many researchers have investigated the impact of message framing on physical activity behavior, hypothesizing that gain framing would work more effectively than loss framing at encouraging exercise (van't Riet et al., 2009). Latimer and colleagues (2008), for example, conducted a nine-week intervention designed to test the effect of message framing on sedentary adults' exercise self-efficacy and participation in physical activity. In their study, participants received gain-framed, loss-framed, or both gain and loss-framed messages regarding exercise at three times throughout the intervention (at weeks one, five, and nine). At week two, the researchers found that participants who had received gain-framed messages reported higher exercise self-efficacy and increased intention to engage in physical activity compared to those who had received loss-framed messages or both gain and loss-framed messages. Furthermore, participants in the gain-framing condition reported greater exercise participation at week nine compared to individuals in the loss-framed or combined framing conditions, suggesting that receiving gain-framed messages alone may have increased the saliency of physical activity's benefits and prompted participants to select the "sure gain" of engaging in physical activity

In 2010, Latimer, Brawley, and Bassett conducted a review of physical activity message framing research, concluding that gain-framed messages have demonstrated greater efficacy than

loss-framed messages at promoting both intention to engage in physical activity and actual physical activity behavior as well. Through their review, Latimer and colleagues suggest that emphasizing the benefits of engaging in physical activity (e.g., exercising reduces your risk of diabetes) should increase the persuasiveness of the message and inspire greater change compared to highlighting the costs associated with failing to engage in physical activity (e.g., a lack of exercise increases your risk of diabetes). Similarly, Gallagher and Updegraff (2012) conducted a meta-analysis, determining that gain-framed messages were significantly more persuasive than loss-framed messages for promoting physical activity behaviors. However, unlike Latimer and colleagues (2010), Gallagher and Updegraff did not find an influence of message framing on attitudes and intentions regarding exercise; their results indicated that message framing influenced behavior without altering intention.

While these two reviews found strong support for using gain framing to promote PA, studies conducted after these reviews have suggested that gain framing may not always be most effective for promoting PA – at least not for all individuals (for review, see Covey, 2014). Bruijn, Out, and Rhodes (2014), for example, found that loss-framed messages are more persuasive for individuals who do not meet the minimum recommendations for exercise. In their study, participants read informational leaflets that contained gain-framed or loss-framed messages regarding exercise. Furthermore, the gain and loss-framed messages were either *attained* outcomes (e.g., gain-framed: if you exercise, you will increase your muscle strength; loss-framed: if you do not exercise, you will increase your chance of having weak muscles) or *avoided* outcomes (e.g., gain-framed: an active lifestyle helps prevent physical illness; loss-framed: an inactive lifestyle prevents good health). Their results indicated that for people who were not active (i.e., individuals who reported not adhering to the exercise recommendations in

the past two weeks), loss-framed messages with attained outcomes were most persuasive and promoted resolve to engage in exercise.

Bruijn and colleagues' (2014) findings suggest that individual characteristics may contribute to the persuasiveness of differently framed messages. In their study, current exercise behavior influenced the type of frame that was most effective – i.e., for inactive individuals, loss frames that highlighted attained outcomes (e.g., “if you do not exercise, you will have an increased chance of becoming overweight) were most persuasive. Similarly, other researchers have found that personal traits influence individuals' receptivity to health messages. Latimer and colleagues (2008), for example, demonstrated that differences in goal orientation, or *regulatory focus*, prompted individuals to respond differently to gain-framed or loss-framed messages. In their study, Latimer and colleagues classified individuals as either “promoters” – individuals who are motivated by accomplishment and pursue goals to ensure the presence of positive outcomes (e.g., individuals who exercise to achieve optimal health) – or “preventers” – individuals who are motivated by security needs and pursue goals to reduce the likelihood of negative outcomes (e.g., individuals who exercise to avoid health problems). As they hypothesized, promoters were more receptive to gain-framed messages and preventers were more responsive to loss-framed messages, as both promoters and preventers who received messages that were “tailored” to their regulatory focus pattern reported greater physical activity compared to individuals who received messages that did not fit with their regulatory focus orientation.

In addition to differing in goal orientation related to exercise, individuals also differ in their motivation for exercising. While some individuals engage in physical activity for reasons related to *intrinsic* motivation (e.g., enjoyment or satisfaction associated with exercising), others

perform physical activity based on *extrinsic* motivation (e.g., appearance or health reasons). Building on regulatory focus theory, Gallagher and Updegraff (2011) investigated gain and loss framing for both intrinsic and extrinsic outcomes, hypothesizing that gain-framed messages would better “fit” with intrinsic outcomes and loss-framed messages would better fit with extrinsic outcomes. In their study, participants read an article that promoted physical activity and contained either gain-framed extrinsic outcomes (e.g., “exercise now and look better later!”), gain-framed intrinsic outcomes (e.g., “exercise now and feel better later!”), loss-framed extrinsic outcomes (e.g., “forgot to exercise? Forget the bathing suit!”), or loss-framed intrinsic outcomes (e.g., “forgot to exercise? Forget being happy!”). Consistent with their hypothesis, gain-framed intrinsic outcomes and loss-framed extrinsic outcomes inspired greater change in physical activity behavior for individuals high in need for cognition (NC). For individuals low in NC, however, the opposite pattern was demonstrated. Gallagher and Updegraff’s results suggest that efficacy of a message frame may be dependent not only on the target behavior, but also on the motivation behind engaging in that behavior.

Extrinsic Motivators for Exercise Behavior

While Gallagher and Updegraff (2011) tested the impact of message framing for intrinsic and extrinsic outcomes of exercise, not all extrinsic outcomes are rooted in the same motivational factors. Extrinsic motivators for exercise can include health interests, weight management, appearance concerns, stress management, and social validation – all of which are different outcomes with unique motivations (Kilpatrick, Hebert, & Bartholomew, 2005). In a study of motivation for exercise among college students, gender differences were revealed, indicating that women tend to report weight management, appearance concerns, and stress reduction as motivators significantly more than men, who tend to report competency and social

recognition as motivators for exercise (Pauline, 2013).

Based on these gender differences for motivation to exercise, Pauline (2013) suggests that physical activity programs should be tailored to participants' underlying motivations behind exercising, specifically noting that framing exercise goals differently for men and women may promote greater change in physical activity behavior. Furthermore, Pauline notes that campus recreation centers should consider gender differences in exercise motivation when designing programs for college-aged men and women, who may respond differently to advertised program outcomes depending on the type of benefits that are highlighted.

Promoting PA via Participation in Group Fitness Classes

Because of woefully low rates of physical activity participation, many approaches for exercise promotion have been tested and implemented. While myriad interventions have focused on increasing individual participation in physical activity (i.e., encouraging an individual to engage in exercise themselves), no studies have tested the efficacy of differently framed messages on the promotion of group fitness classes – i.e., exercise classes in which a certified instructor or trainer leads a group of individuals through a prescribed workout. According to a survey of global consumer exercise trends (Nielsen, 2014), 36 percent of regular exercisers participate in fitness classes – compared to 18 percent of exercisers who use cardio machines, and 29 percent of exercisers who run/jog, for example – suggesting that group fitness classes are a popular exercise option (at least for regular exercisers). In fact, aside from walking – an activity that approximately 59 percent of exercisers report engaging in – and “equipment type activities,” such as utilizing free weights and/or weight machines (which 37 percent of exercisers report performing), group fitness classes are the single most popular fitness option for regular exercisers (Nielsen, 2014).

While encouraging PA in any form is undeniably beneficial, inspiring participation in group fitness classes may be more advantageous than promoting individual PA, as group fitness classes also offer the added benefits of social support and perceived accountability (Estabrooks, 2000). Spink and Carron (1992), for example, found that perceived group cohesion in fitness classes led to greater adherence for women participating in exercise classes. Similarly, a meta-analysis conducted by Carron, Hausenblas, and Mack (1996) concluded that exercising with others promoted greater exercise adherence compared to exercising alone. Furthermore, Yorks, Frothingham, and Schuenke (2017) found that participation in group fitness classes led to lower perceived stress and increased quality of life compared to exercising alone or not exercising, suggesting that additional mental health benefits may be garnered by exercising in a group setting.

Despite the theoretical support for fitness classes in terms of physical activity promotion (and continued adherence to physical activity behaviors), no research has investigated the manner in which fitness classes are marketed, or *framed*, to potential participants. Likewise, no research has examined whether exposure to differently-framed messages influences individuals' exercise performance (i.e., if different frames may promote different outcomes during exercise) via inducing particular exercise-related mindsets. As group fitness classes are a popular exercise option – and given that group fitness classes offer advantages compared to exercising alone – it is undoubtedly worthwhile to determine the most effective ways to promote group fitness classes. Likewise, it is valuable to investigate whether the manner in which group fitness classes are marketed influences individuals' experience during these classes.

Instilling Mindsets

A significant body of work has demonstrated the powerful impact one's mindset – i.e.,

one's set of beliefs, thoughts, and expectations – can have on one's experiences and outcomes across a variety of domains (Dweck, Walton, & Cohen, 2014). Most famously, Dweck and colleagues have found a great deal of support for the notion that students' mindsets regarding intelligence affect their academic motivation and achievement; according to Dweck's research, students who believe their intelligence can be developed (i.e., a *growth mindset*) outperform students who believe their intelligence is static (i.e., a *fixed mindset*) across a variety of academic achievement measures (e.g., grade point average, course exam scores, course grades, and standardized test scores). Additionally, Dweck has found evidence that one's mindset can be altered – i.e., a growth mindset can be fostered – to enhance academic performance (for review, see Dweck, 2015).

Despite early evidence suggesting that growth and fixed mindsets (and interventions designed to alter fixed mindsets) produce large differences in student achievement, recent research has been less conclusive; in a meta-analysis examining the impact of mindset on academic achievement, Sisk and colleagues (2018) found weak correlations between mindset and academic outcomes. However, single randomized controlled trials have found evidence that growth mindset interventions produce positive health outcomes (i.e., increased perceived health and fewer doctor visits) and academic achievement outcomes (i.e., higher grade point averages) for minority students (Walton & Cohen, 2011), suggesting that mindset interventions may be effective for at least some groups of students.

While a great deal of attention has been devoted to the influence of mindsets in the educational arena, one's mindset is also a key factor in various domains of health (Crum & Corbin, 2011). For example, Crum, Salovey, and Achor (2013) found that individuals' mindsets related to stress influenced their physiological and psychological stress response; individuals

who had a “stress-is-enhancing” mindset instilled (via exposure to short video clips regarding the nature of stress) fared better (i.e., had lower cortisol reactivity) during a stressful situation compared to individuals who were instilled with a “stress-is-debilitating” mindset. This demonstrates that mindset can influence individuals’ physiological functioning in addition to influencing behavioral outcomes.

The influence of one’s mindset on physiological functioning has also been demonstrated with respect to individuals’ satiation levels based on the mindset they have related to food consumption (Crum & Corbin, 2011). In their study, all participants consumed a 380-calorie milkshake but were informed that it was either a 620-calorie “indulgent” shake or a 140-calorie “sensible” shake. Consistent with the idea that one’s mindset can alter physiological responses, individuals who believed they were consuming the high-calorie shake demonstrated a significantly steeper decline in ghrelin (a hormone that, when secreted, produces the sensation of hunger) compared to individuals who believed they were partaking in a low-calorie shake. This provides evidence that altering individuals’ mindsets related to food consumption (i.e., instilling a “sensible eating” mindset compared to a mindset of indulgence) can actually influence individuals’ physical experience of satiation.

Crum and Langer (2007) have also found evidence that individuals’ mindset regarding exercise can produce long-term physiological differences, demonstrating that the relationship between exercise and physical health can be mediated by one’s mindset. In their study, hotel room attendants who were told that their work (i.e., cleaning hotel rooms) is good exercise that satisfies the Surgeon General’s physical activity recommendations perceived themselves as getting more exercise compared to hotel room attendants who were not instilled with this mindset. Furthermore, participants who had their mindset altered to believe they were attaining

more exercise showed a decrease in weight, body fat percentage, and blood pressure (over a four-week period) compared to attendants in the control condition who did not have their mindset altered. This provides considerable evidence that individuals' mindsets related to physical activity – i.e., their perception of physical activity and its influence on health – may influence the extent to which individuals reap that physiological benefits associated with exercise.

Present Study

The present study sought to address the dearth of empirical research regarding message framing for exercise classes and was designed to investigate the most effective method(s) to market fitness classes by utilizing message framing techniques. This study uniquely contributed to the existing framing research by testing message framing for structured exercise classes rather than for general physical activity outcomes. Furthermore, the results of this study are directly applicable to increasing exercise behavior, as gyms/recreation centers can use the information garnered to frame their classes in the most effective manner to attract participants and encourage participation in physical activity. Additionally, by considering the influence that message framing may have on individuals' mindsets, this study provided insight as to whether having a particular mindset instilled via exposure to specific frames influences individuals' experiences in fitness classes.

This study had two primary goals – (1) to determine which type of frame is most effective at attracting participants (i.e., to discover if individuals are more likely to attend classes if the class descriptions are framed in a particular manner) and (2) to determine if the manner in which classes are framed influences participants' exercise-related mindsets and, consequently, their exercise class outcomes. Accordingly, two experiments were performed to address the

influence of message framing on exercise class attendance and individuals' performance during an exercise class based on the expectations they were provided regarding the class.

In experiment 1, participants viewed four class descriptions, each of which contained a different frame – appearance gain, appearance loss, health gain, and health loss – and selected one class to attend, allowing me to determine if classes featuring certain frames are more attractive to participants. In experiment 2, participants had an exercise-related mindset instilled (via a frame) prior to attending an exercise class, enabling me to establish whether exposure to different frames produces different outcomes. All participants in experiment 2 attended the same class; only their mindset regarding the class was altered. Participants in experiment 2 also wore an accelerometer such that I was able to objectively measure physical activity levels during the class.

Hypotheses

Hypothesis 1 – Based on prior research (Lundeberg & Graham, under review), I hypothesized that participants would be more likely to select to attend classes that were framed in terms of appearance gains (Hypothesis 1a). Additionally, given gain framing's demonstrated efficacy in the physical activity realm (e.g., Latimer et al., 2010; Gallagher & Updegraff, 2012), I hypothesized that both gain frames (appearance gain and health gain) would be more effective than either loss frame (i.e., participants would be more likely to select classes that were framed in terms of gains rather than losses) (Hypothesis 1b). Lastly, I hypothesized that classes whose descriptions featured appearance-related outcomes would be selected at higher rates than those whose descriptions featured health-related outcomes (Hypothesis 1c) given that college-aged exercisers tend to be motivated by extrinsic factors (e.g., appearance and social recognition) compared to intrinsic factors (Pauline, 2013).

Hypothesis 2 – I also hypothesized that participants would report greater enjoyment of (Hypothesis 2a) and effort in (Hypothesis 2b) classes described using gain frames. I expected that if participants perceived benefits of attending the class, that perception would positively influence their experience during the class and would prompt them to put forth more effort in the class in an attempt to attain the associated benefits.

Hypothesis 3 – Lastly, I hypothesized that individuals' mindsets related to the exercise classes would produce physiological differences during the exercise classes. Based on Crum and Langer's (2007) study, I hypothesized that individuals who had an "appearance gain" mindset instilled – i.e., individuals who were provided the expectation that the class they were attending could produce appearance-related benefits – would expend more energy (measured via accelerometry) compared to individuals in alternative framing conditions.

CHAPTER 2 – METHOD

Experiment 1 – Class Attendance

Participants

Participants were undergraduate students enrolled in an introductory psychology course at Colorado State University. Participants were recruited via use of the psychology research pool, and students received course credit for their participation. Study 1 included 189 participants. For demographic information, see Table 1.

Table 1

Participant Demographics – Experiment 1

Age	$M = 19.0$ years ($SD = 1.41$)
Race	
American Indian/Native American	1.87%
Asian	5.14%
Black/African American	4.67%
Hispanic/Latino	11.21%
Pacific Islanders	0.47%
White/Caucasian	75.70%
Other	0.93%
Gender	
Female	69.84%
Male	30.16%
Other	0.0%

Materials and Procedures

Study 1 was designed to determine the influence of message framing on individuals' attendance of fitness classes – i.e., whether individuals are more likely to choose to attend classes based on the manner in which the class descriptions are framed (e.g., health frame vs. appearance frame). Accordingly, study 1 employed a within-subjects design; each participant encountered all

of the framing conditions such that I could determine whether a certain type of frame was more likely to draw class attendees compared to other types of frames.

In study 1, participants first completed an in-person laboratory visit (T1). During this initial visit, participants were informed that they would be reading descriptions of different fitness classes offered at Colorado State University's Recreation Center and would need to select one class to attend as part of the study requirements. Participants were told: "*The Rec Center offers a variety of fitness classes. Please read the descriptions of the following fitness classes and select one of these classes to attend.*" Participants then read descriptions of four different fitness classes and chose one class they would later attend. The four class descriptions each utilized a different type of frame – appearance gain, appearance loss, health gain, and health loss (see Appendix A for framings of the four different classes included in study 1).

Because study 1 sought to determine whether certain frames are more effective than others at attracting class attendees, it required participants to see all of the framing options and select among classes that utilized different frames. However, altering a description for a particular class by solely changing the framing technique posed a problem in that differently framed class descriptions are inherently similar in terms of explicatory (i.e., class mechanics) information. As such, it would have potentially been confusing for participants to see the same exact class (e.g., Cardio Hits) described in four different ways (i.e., a slightly different description for each frame). Accordingly, study 1 employed a Latin Square design, such that each participant was exposed to all of the framing conditions but saw a different – but comparable – class for each type of frame.

Four descriptions were presented for four different classes offered at the CSU Recreation Center – one description for each type of frame to be tested – such that there were 16 total class

descriptions participants could have seen (see Appendix B). Each participant saw only one description for each of the four classes, and each of those four classes contained a different type of frame. For example, a participant might have seen (1) a TABATA class description that featured an appearance gain frame, (2) a Sculpt class description that used an appearance loss frame, (3) a Bootcamp class that included a health gain frame, and (4) a Cardio Hits class that contained a health loss frame (see Appendix B for a visual representation of the Latin Square design). Utilizing this design allowed participants to encounter each level of the framing manipulation (i.e., see all four of the frames) while maintaining the realism of participants selecting from an array of classes – as they would if they were on their own selecting a class to attend at a Fitness Center – rather than simply choosing among four incredibly similar class descriptions.

After participants read the class descriptions and selected the class they would like to attend, participants were presented with the CSU Recreation Center's Group Fitness schedule and received instruction to attend a meeting of their selected class that fit into their schedule within a week of their laboratory (T1) visit. A research assistant aided participants in selecting a specific class (i.e., finding classes that matched the participants' preferred selection) to attend within a week of their initial visit. For example, if a participant indicated they would like to attend a HIIT class, the research assistant aided the participant in finding a HIIT class at the Recreation Center that they was able to attend sometime in the next week. The research assistant recorded the class the participant would be attending (i.e., class, date, and time) such that reminder emails could be sent to the participant the day before they would be attending the class at the Recreation Center. Reminder emails were sent out 24 hours before the participant's class was scheduled to begin.

Upon selecting a specific class to attend, participants were also asked to complete a series of questionnaires that assessed individual differences related to exercise behavior that may be related to class preference. First, participants completed the Self-Efficacy for Exercise Questionnaire (Sallis et al., 1988; see Appendix C), which has demonstrated consistently high reliability and criterion validity (see Sallis et al. for scale development and Wilcox et al. (2005) for further psychometric assessment). The Self-Efficacy for Exercise Questionnaire (SEEQ) is a 12-item measure that asks people to indicate their confidence in their ability to exercise when faced with common barriers to exercise (e.g., work demands, family time, etc.). Respondents indicate how sure they are that they could do things like “stick to your exercise program when undergoing a stressful life change” or “stick to your exercise program after a long, tiring day of work” utilizing a five-point Likert Scale from 1 = I know I cannot to 5 = I know I can. Higher scores on the SEEQ indicate higher levels of exercise self-efficacy, while lower scores indicate lower levels of exercise self-efficacy.

In addition to the Self-Efficacy for Exercise Questionnaire, participants were asked to report their average exercise frequency (i.e., the amount of moderate-to-vigorous physical activity (MVPA) they typically engage in during an average week), as I hypothesized regular exercisers may have different frame preferences compared to non-exercisers (i.e., regular exercisers may prefer gain frames, while non-exercisers may be more motivated by loss frames, as was the case in Bruijn et al.’s (2014) study). Participants were asked to complete a 7-Day Physical Activity Recall (7D-PAR), a measure of exercise frequency that has demonstrated high convergent validity and high test-retest reliability (Sallis, 1985; see Appendix D). The 7D-PAR asks participants to estimate the number of hours they engaged in moderate or vigorous physical activity (after participants are provided with examples of these types of activities). Based on their

responses on the 7D-PAR, participants were split into two groups – those who met exercise recommendations (i.e., individuals who reported engaging in at least 150 minutes of moderate physical activity during the past week) and those who did not meet recommendations (i.e., individuals who reported engaging in less than 150 minutes of moderate physical activity during the past week).

As I hypothesized that individual differences in health- and appearance-concern may influence the efficacy of the framings, I also asked participants to complete the Concern for Health and Appearance Scale (Hayes & Ross, 1987; see Appendix E), an adapted version of Wallston, Wallston, and Devellis' Health Locus of Control Scale that has demonstrated relatively high reliability (Hayes & Ross, 1987). Participants indicated their level of health concern by responding to statements such as “I reflect a lot about my health” and “I’m constantly examining my health” and appearance concern by responding to statements such as “I reflect a lot about my appearance” and “I’m constantly examining my appearance” (from 1 = strongly disagree to 4 = strongly agree). Higher scores indicated greater concern for health and appearance, respectively.

To determine if BMI related to class and framing preferences, I also asked participants to report their height and weight during their laboratory (T1) initial visit. Participants also self-reported demographic information (i.e., age, sex, and race).

After selecting a class to attend and completing the T1 questionnaire at their initial visit, participants were instructed to attend their chosen class and were required to receive a signature from the group fitness instructor upon completion of the class for verification of course completion. Participants were required to attend only one meeting of their chosen class (i.e., the attendance rate was 100% for all classes in study 1). Additionally, the course verification sheet contained a questionnaire that participants completed (see Appendix F) regarding their

experiences during the group fitness class of their choosing to determine if exposure to different frames produced different class outcomes (T2). Participants were asked to self-report (a) how much they enjoyed the class (on a scale of 0 = did not enjoy at all to 5 = enjoyed very much), (b) how much effort they put into the class (on a scale of 0 = no effort at all to 5 = maximum effort), (c) whether they would attend the class again, and (d) perceptions of how much the class benefited their health and appearance and/or aided them in avoiding health or appearance-based problems (i.e., a manipulation check to determine the saliency of the frames).

Statistical Analyses

To determine the influence of message framing on individuals' attendance of fitness classes – i.e., whether individuals were more likely to select classes to attend based on the manner in which the class descriptions were framed – I conducted a chi-square test of goodness of fit to determine if equal preference was shown for the four differently framed classes (appearance gain, appearance loss, health gain, and health loss). A chi-square goodness of fit test allowed me to ascertain whether the four differently framed classes were selected at equal rates or if a particular frame (i.e., appearance gain, as predicted in Hypothesis 1a) elicited greater attendance rates. Additionally, I conducted separate chi-square goodness of fit tests to determine whether gain frames were selected at different (i.e., higher, as predicted in Hypothesis 1b) rates than loss frames and whether appearance frames were selected at different (i.e., higher, as predicted in Hypothesis 1c) rates than health frames.

In addition to assessing overall selection tendencies for the different frames, analyses were also conducted to determine if different types of individuals were differentially affected by the framing of the class descriptions (i.e., if individual difference variables influenced the rates at which class descriptions were selected by participants as their most preferred class description).

Accordingly, Multinomial Logistic Regressions were conducted to test whether individuals with differing levels of exercise self-efficacy (ESE), exercise behavior (i.e., average exercise frequency), and exercise motivation (i.e., higher health concern and/or appearance concern) were differentially likely to select certain class descriptions (i.e., particular frames) to attend.

Lastly, to determine whether participants reported greater enjoyment of and effort in classes described using gain frames (as predicted in Hypotheses 2a and 2b respectively), I conducted two 2 (appearance vs. health) X 2 (gain vs. loss) factorial Analyses of Variance (ANOVAs) – one to assess enjoyment and one to assess effort – to determine if participants’ self-reported enjoyment and effort were affected by the framing type (gain vs. loss) and framed content (appearance vs. health) utilized to describe the classes.

Experiment 2 – Exercise Experiences

Participants

Participants were undergraduate students enrolled in an introductory psychology course at Colorado State University. Participants were recruited via use of the psychology research pool, and students received course credit for their participation. Study 2 included 131 participants. For demographic information, see Table 2.

Table 2

Participant Demographics – Experiment 2

Age	<i>M</i> = 18.76 years (<i>SD</i> = 1.24)
Race	
American Indian/Native American	3.28%
Asian	9.29%
Black/African American	2.19%
Hispanic/Latino	14.75%
Pacific Islanders	0.0%
White/Caucasian	67.76%
Other	2.73%

Gender	
Female	63.64%
Male	36.36%
Other	0.0%

Materials and Procedures

While study 1 was designed to determine if different frames are more likely to attract participants to fitness classes – i.e., were participants more likely to choose to attend classes whose descriptions employed a particular type of framing? – study 2 sought to investigate whether exposure to different frames influenced individuals’ experiences of *the same* exercise class. In study 2, participants had an exercise class-related expectation provided – i.e., a *mindset* instilled – (via a frame) prior to undertaking a group fitness class, thereby enabling me to assess whether exposure to different frames produces different outcomes when participants attend the same class. Therefore, study 2 utilized a between-subjects design, such that each participant was exposed to only one type of framing.

In study 2, participants were randomly assigned to one of five conditions – appearance gain, appearance loss, health gain, health loss (i.e., the four frames included in study 1), or a control condition that did not contain any type of framing in the class description and simply described the class format (i.e., identified the type of class the participant would be completing). Participants were told that they would be attending a class at the Student Recreation Center and that they would be provided with a description of the class they would be attending when they arrived to complete the class. For all participants, the class remained the same; only the framing varied (refer to Appendix G for the five differently-framed descriptions of the same class).

Prior to participating in the fitness class, participants were asked to complete an online questionnaire. Participants were provided with a link to a Qualtrics survey that assessed demographic information (i.e., sex, age, and race) and also asked participants to report their

height and weight such that biometric information would be available for the actigraphy data analyses. Participants were emailed the Qualtrics link and were instructed to complete the online survey before arriving to their scheduled fitness class session.

Upon enrolling in study 2, participants signed up for one of four times to participate in a fitness class. Participants received no information as to the type of class they would be completing until they arrived for their chosen session. The four sessions occurred on the same week day and time across a four-week period (i.e., the same class was taught by the same instructor on four consecutive Mondays at 2:00 pm). When participants arrived at their chosen session, they were randomly assigned to one of the framing conditions as they entered the fitness studio. Five research assistants were stationed at five different locations in the large fitness studio, and participants were instructed to “check in” at one of the five stations (each of which contained materials for one of the five framing conditions) upon their arrival. At their randomly assigned station, participants read a description of the class they would be completing (a printed description was provided by the research assistant) that contained the framing manipulation. Participants were therefore exposed to the framing manipulation immediately prior to completing the fitness class.

Prior to the start of the class (during the check-in procedure), participants were given an ActiGraph (Model GT9X) accelerometer (i.e., activity tracker) they were asked to wear during the class so I could attain an objective measure of activity during the class to determine if the mindset produced by exposure to the differing frames altered individuals’ activity level during the class. The use of accelerometers, including ActiGraphs, is the gold standard for collecting objective physical activity data, as the devices have demonstrated consistently high validity with

regard to accurately capturing minutes spent engaging in MVPA (for review of assessing physical activity via accelerometers, see Plasqui et al., 2013).

Once participants had read the class descriptions (i.e., were exposed to the framing manipulation) and donned their Actigraphs, participants engaged in a 45-minute barbell class taught by an ACE-certified group fitness instructor. The exact same class was taught in all four of the sessions in study 2, and each session contained individuals randomly assigned to all five framing conditions. The barbell class that participants completed was a highly standardized class (Les Mills' "BODYPUMP" – a pre-choreographed class that, consequently, contains the exact same exercises in the exact same order during every class). Opting for this style of fitness class ensured consistency across the four different class sessions and minimized the likelihood of differences among the four sessions.

Immediately upon completing the barbell class, participants were asked to complete a post-class questionnaire that assessed individuals' experiences during the class (see Appendix H). While objective measures of physical activity performance (i.e., actigraphy data) were collected during the class, participants were asked to self-report exertion (i.e., indicate how much effort they felt they expended) during the class via the category-ratio version of the Borg Ratings of Perceived Exertion (RPE) Scale (Borg, 1998). The Borg CR10 Scale is a category-ratio scale anchored at 0 and 10, such that 0 indicates no physical effort/exertion and 10 indicates maximum physical effort/exertion.

In this post-class questionnaire, participants were also asked to self-report how much they enjoyed the class (on a scale from 0 = did not enjoy at all to 10 = enjoyed very much) and indicate perceptions of how much the class benefited their health and appearance and/or aided them in avoiding health or appearance-based problems (i.e., a manipulation check to determine

the saliency of the frames, as included in study 1). Participants were also asked to indicate whether they had any previous experience with the class and/or instructor in order to control for potential confounding factors.

Statistical Analyses

To test whether individuals' mindsets related to the exercise classes produced physiological differences during the exercise classes – i.e., if individuals who had an “appearance gain” mindset instilled via exposure to the relevant frame expended more energy (as predicted in Hypothesis 3) – I conducted two separate 3 (framing type – gain/loss/control) X 3 (framed content – appearance/health/control) factorial Analyses of Variance (ANOVAs) to determine if the number of minutes participants spent engaging in MVPA and number of calories participants burned (both measured via accelerometry) differed based on the framing condition. Additionally, I conducted a 3 (framing type) X 3 (framed content) factorial ANOVA to determine whether participants' self-reported effort differed based on the framing conditions. Lastly, I conducted a final factorial Analysis of Variance to determine whether participants' enjoyment of the class was affected by the framing of the class.

CHAPTER 3 – RESULTS

Experiment 1 – Class Attendance

Frame Selection (I.e., Class Attendance)

A chi-square test of goodness-of-fit was performed to assess whether the four different class frames were selected equally. As predicted, selection of the four frames was not distributed equally ($\chi^2(3, N = 189) = 21.86, p < .001$). As shown in Figure 1 (and predicted in Hypothesis 1a), participants were most likely to select classes to attend when the class description utilized an appearance gain frame. Interestingly, while I predicted (in Hypothesis 1b) that both gain frames (appearance and health) would be more effective than either loss frame (i.e., that participants would be more likely to choose to attend classes framed in terms of gains rather than losses), participants were equally likely to select classes whose descriptions included a health gain frame or an appearance loss frame. Participants were least likely to select classes whose descriptions featured a health loss frame.

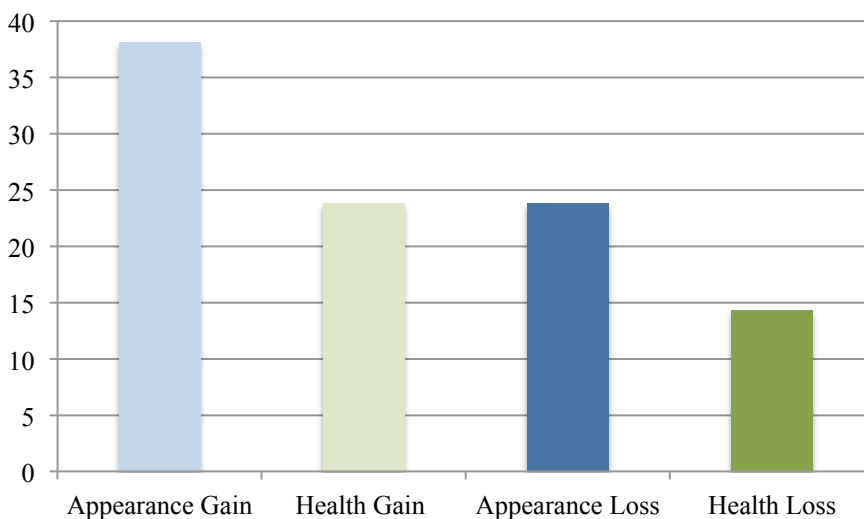


Figure 1

Participants' Class Selection

Note. Percentage of participants who selected to attend classes whose descriptions included the four different types of frames.

To investigate the isolated impact of gain framing compared to loss framing (i.e., to determine whether gain frames and loss frames were selected at equal rates), I conducted a separate chi-square goodness of fit test. As expected, gain frames were selected at higher rates than loss frames ($X^2(3, N = 189) = 10.71, p < .001$). Similarly, I conducted a chi-square goodness of fit test to ascertain whether appearance frames and health frames were selected at equal rates. As expected, appearance frames were selected more frequently than health frames ($X^2(3, N = 189) = 10.71, p < .001$). See Figure 2 for the distribution of the selection of gain frames compared to loss frames and appearance frames compared to health frames.

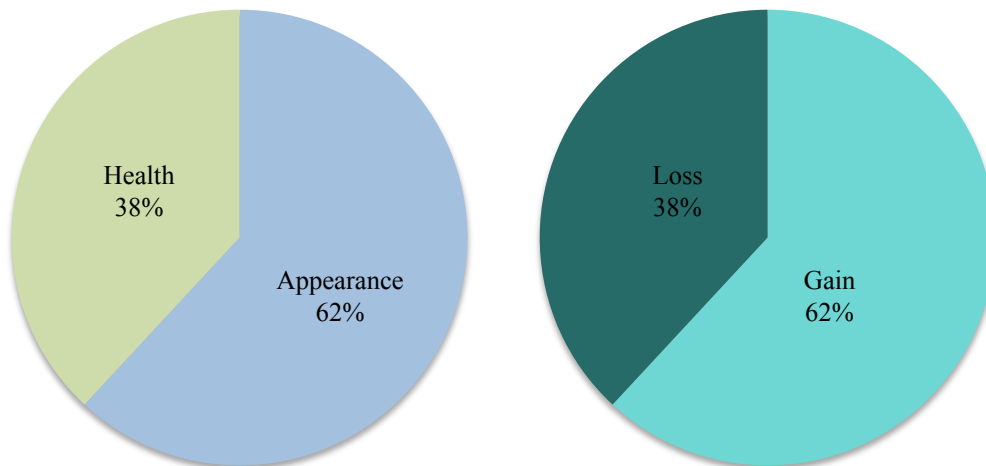


Figure 2

Participants' Class Selection

Note. Percentage of participants who selected to attend classes whose descriptions included gain frames compared to loss frames (left) and appearance frames compared to health frames (right).

Covariates

To examine whether individuals with differing levels of ESE, exercise frequency, BMI, and health/appearance concern selected class descriptions (i.e., certain frames) at differing rates, Multinomial Logistic Regressions were conducted. No significant effects were found for the individual difference variables of exercise frequency, BMI, health concern, or appearance concern (p values $> .05$), indicating that exercise frequency, BMI, and exercise motivation (i.e.,

health and/or appearance concern) did not affect the rates at which classes were selected by participants as the class they attended. However, a significant effect was found for ESE ($\chi^2(102, N = 189) = 137.25, p = .01$, suggesting that individuals with differing levels of ESE were more likely to select particular frames at different rates, such that individuals with higher ESE were more likely to select classes whose descriptions featured health losses. For the mean ESE of individuals who selected the four differently-framed classes (appearance gain, appearance loss, health gain, and health loss), see Table 3.

Table 3

Mean Exercise Self-Efficacy (ESE) by Selected Class (i.e., Chosen Frame)

ESE	M	SD
Appearance Gain	44.33	7.78
Appearance Loss	43.44	7.65
Health Gain	43.04	8.41
Health Loss	44.56	7.65

In-Class Experiences

To determine if the framing included in the selected class influenced participants' self-reported enjoyment of and effort in the chosen class, two separate 2 (framing type: gain vs. loss) X 2 (framed content: appearance vs. health) factorial Analyses of Variance (ANOVAs) were conducted – one for enjoyment and one for effort. Contrary to my predictions (in Hypothesis 2a), there was no significant effect of framing type (gain vs. loss) on reported enjoyment of classes ($F(1,156) = 2.61, p = 0.11$), nor was there a significant effect of framed content (appearance vs. health) on reported enjoyment of classes ($F(1,156) = 0.27, p = 0.61$). Additionally, there was no significant interaction between framing type (gain vs. loss) and framed content (appearance vs. health) on participants' enjoyment ($F(1,156) = 0.97, p = 0.33$); participants reported equal

enjoyment of classes regardless of the type of frame and framing content included in the class they selected.

While framing condition did not influence participants' self-reported enjoyment of their chosen class, the frame included in the selected class did impact the effort participants reported putting forth these classes. Specifically, there was a significant main effect of framing type (gain vs. loss) on self-reported effort ($F(1,156) = 6.58, p = 0.01$). As predicted (in Hypothesis 2b), participants who attended classes whose descriptions included gain framing reported exerting more effort in the class compared to participants who attended classes whose descriptions included loss framing (see Figure 3). There was no significant effect of framed content (appearance vs. health) on effort, however ($F(1,156) = 0.34, p = 0.56$), nor was there a significant interaction between framing type (gain vs. loss) and framed content (appearance vs. health) ($F(1,156) = 0.01, p = 0.91$).

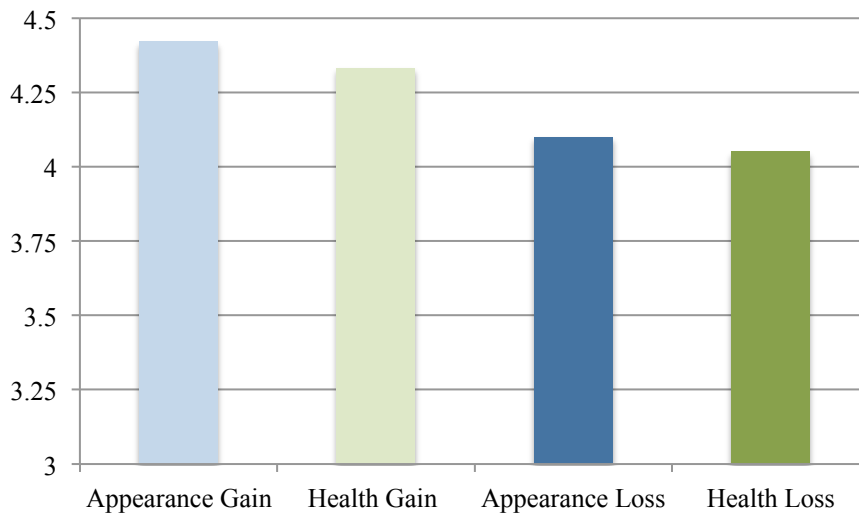


Figure 3

Participants' Effort in Differently Framed Classes

Note. Participants' self-reported effort (from 0 = no effort at all to 5 = maximum effort) in their attended class by framing condition of the selected class.

Experiment 2 – Exercise Experiences

To determine if the type of frame included in the class description participants viewed prior to engaging in a class influenced individuals' energy expenditure in said class, two separate 3 (framing type) X 3 (framed content) factorial Analyses of Variance (ANOVAs) were conducted – one for the amount of minutes of MVPA and one for calorie expenditure. Contrary to my predictions (in Hypothesis 3), there was no significant effect of framing type (gain vs. loss vs. control) on either metric of energy expenditure (MVPA minutes: $F(1,126) = 0.09, p = 0.76$; caloric expenditure: $F(1,126) = 0.67, p = 0.42$), nor was there a significant effect of framed content (appearance vs. health vs. control) on either measure of objective energy expenditure (MVPA minutes: $F(1,126) = 0.87, p = 0.35$; caloric expenditure: $F(1,126) = 1.16, p = 0.29$). Furthermore, there was no significant interaction between framing type (gain vs. loss vs. control) and framed content (appearance vs. health vs. control) on participants' energy expenditure in the fitness class (MVPA minutes: $F(1,126) = 1.21, p = 0.27$; caloric expenditure: $F(1,126) = 0.01, p = 0.93$). As shown in Table 4, participants' energy expenditure (i.e., the number of MVPA minutes engaged in and the number of calories burned) was not influenced by the type of frame or framing content included in the class description they viewed prior to engaging in the class.

Table 4

Mean Objective Energy Expenditure (MVPA Minutes and Caloric Expenditure) by Frame

	<u>MVPA Minutes</u>		<u>Calories Expended</u>	
	M	SD	M	SD
Appearance Gain	36.50	4.83	159.10	74.50
Appearance Loss	35.04	5.41	169.96	56.94
Health Gain	34.38	5.82	147.20	59.47
Health Loss	35.21	4.91	155.95	67.67
Control	36.08	5.51	155.08	55.54

In addition to assessing the impact of framing condition on individuals' objective energy expenditure during a fitness class, I also conducted a 3 (framing type) X 3 (framed content) factorial Analysis of Variance (ANOVA) to determine whether individuals' subjective (i.e., self-reported) exertion differed based on the frame they were exposed to. Contrary to my predictions, there was no significant effect of framing type (gain vs. loss vs. control) on participants' self-reported exertion ($F(1,125) = 2.30, p = 0.13$), nor was there a significant effect of framed content (appearance vs. health vs. control) on reported exertion ($F(1,125) = 0.71, p = 0.40$) or a significant interaction between framing type and framed content ($F(1,125) = 0.001, p = 0.98$). Regardless of the frame individuals were exposed to, participants did not differ in the amount of effort they reported exerting in the class.

While my primary hypotheses in Study 2 related to energy expended during a fitness class, I also performed a 3 (framing type) X 3 (framed content) factorial Analysis of Variance (ANOVA) to assess whether individuals' enjoyment of the same fitness class differed based on the manner in which the class was framed prior to its start. The ANOVA revealed a trend effect of framing type (gain vs. loss vs. control) on participants' enjoyment of the class ($F(1,125) = 3.01, p = 0.08$); individuals who were assigned to view a gain frame or no frame reported more enjoyment of the class compared to those who read a description that included loss framing (see Figure 4). There was no significant effect of framed content (appearance vs. health vs. control), however ($F(1,125) = 0.00, p = 0.98$), nor was there an interaction between frame type and framed content ($F(1,125) = 0.06, p = 0.81$).

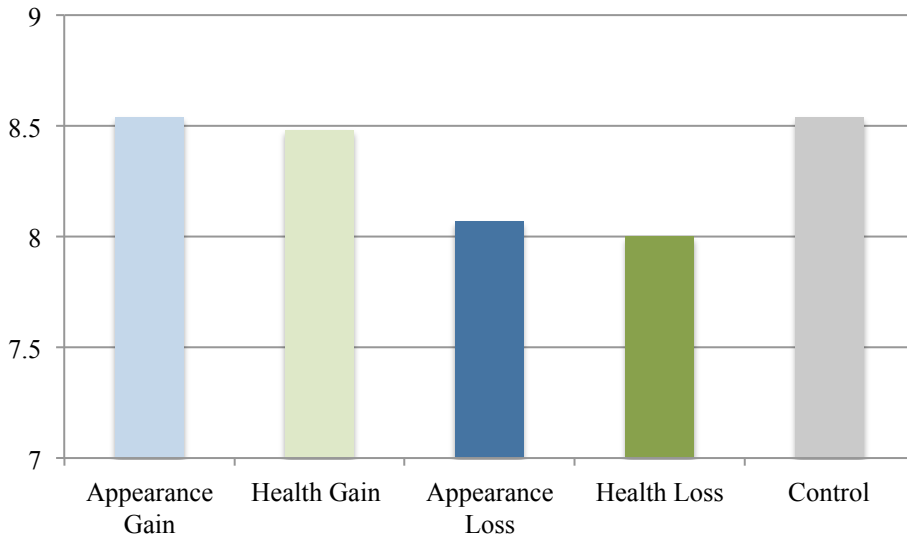


Figure 4

Participants' Class Enjoyment by Framing Condition

Note. Participants' self-reported enjoyment (from 0 = did not enjoy at all to 10 = enjoyed very much) in the same class based on the frame included in its description (presented pre-class).

CHAPTER 4 – DISCUSSION

The present research investigated the impact of message framing on individuals' attendance of – and performance in – group fitness classes. Together, studies 1 and 2 sought to determine which combination of gain/loss and appearance/health frames is most effective at encouraging attendance of fitness classes (study 1) and which framing combination inspires the greatest amount of physical exertion (study 2).

With regard to class attendance (study 1), it was hypothesized based on previous research related to message framing of group fitness classes (Lundeberg & Graham, under review) that participants would be more likely to select classes to attend that were framed in terms of appearance gains (Hypothesis 1a). Additionally, I hypothesized that both gain frames (appearance and health) would be more effective than either loss frame (i.e., participants would be more likely to select classes to attend that were framed in terms of gains rather than losses) (Hypothesis 1b), as an abundance of research has suggested a benefit of gain framing compared to loss framing for inspiring changes in exercise behavior (for review, see Latimer et al., 2010; Gallagher & Updegraff, 2012).

Hypothesis 1a was supported, as participants in study 1 overwhelmingly chose to attend classes whose descriptions included appearance-related gains. However, Hypothesis 1b was not fully supported, as participants were equally likely to select classes whose descriptions included a health gain frame or an appearance loss frame. Overall, participants were indeed more likely to select gain frames over loss frames (i.e., the majority of participants did select gain-framed classes to attend, as predicted in Hypothesis 1b), but that difference was largely driven by the abundance of participants who chose to attend classes whose descriptions included appearance-

related gains – i.e., of those participants who selected to attend gain-framed classes, significantly more chose classes featuring appearance-related gains (61.54%) compared to health-related gains (38.46%; test for one proportion $z = 2.49$, $p = 0.01$).

Considered as a whole, these findings are consistent with much of the research regarding message framing for PA (e.g., Latimer et al., 2010; Gallagher & Updegraff, 2012) that suggests an advantage for gain framing compared to loss framing for encouraging physical activity – that is, participants in study 1 were in fact more likely to choose to attend classes whose descriptions featured gain framing. However, it is interesting – and inconsistent with the aforementioned research – that participants in this study chose to attend classes whose descriptions contained health-related gain framing and appearance-related loss framing at equal rates. This suggests that, at least for the college-aged sample, appearance-related content may carry more weight than health-related content; appearance losses seemed to be just as inspiring as health gains, indicating that college students may value appearance-related outcomes more than health-related outcomes when considering which fitness classes to attend. This is unsurprising (and consistent with Hypothesis 1c), particularly given the primarily female (69.84% in study 1) sample, as women tend to report appearance-related factors as motivators for exercise more than men (Pauline, 2013). It is possible that in an older or more gender diverse sample that the impact of appearance-related content would be reduced and gain framing would be equally effective regardless of the type of content (appearance vs. health) included in the class descriptions, as is typical in most message framing interventions related to PA behavior.

Gallagher and Updegraff (2011), however, did interestingly find that for individuals high in need for cognition, promoting exercise via loss-framed extrinsic outcomes (i.e., warning individuals that their appearance could deteriorate if they did not exercise) was more effective

than including gain-framed extrinsic outcomes (i.e., alerting individuals that exercise could improve their appearance). Their results suggest that certain motivators (e.g., appearance-related outcomes) may actually be effective when loss framed, at least for some individuals. In study 1, regardless of the mode of framing (i.e., gain vs. loss framing), college-aged participants appeared to be motivated by appearance-related (i.e., extrinsic) factors. Gain framing seemed essential to draw participants to classes whose descriptions included health-related outcomes, however.

In addition to predicting that participants would be more likely to attend gain-framed classes in study 1, it was also hypothesized that participants would report greater enjoyment of and effort in classes described using gain frames (Hypotheses 2a and 2b). It was expected that if participants perceived they would attain benefits by attending the class they selected, that perception would positively influence their experience in the class and prompt them to put forth more effort in the class in order to attain the possible benefits associated with attending the class. Contrary to my predictions (in Hypothesis 2a), participants reported equal enjoyment of classes regardless of the type of frame (i.e., gain vs. loss) and framing content (i.e., appearance vs. health) included in the class they selected. These results are surprising, as I speculated that individuals who selected to attend gain-framed classes would “self-instill” a mindset related to their expectations for the class (i.e., that individuals would create a “benefit mindset” and be more likely to perceive the class as being a positive experience). Walton and Cohen (2011), for example, found a positive influence on individuals’ perception of healthfulness (i.e., self-reported health and well-being) when individuals were instilled with a growth mindset, suggesting that mindsets can positively alter one’s perception. Accordingly, I would have expected that instilling a “benefit mindset” would have increased perceived enjoyment of the chosen class. This was not the case, however.

While framing condition did not influence participants' self-reported enjoyment of their chosen class, the frame included in the selected class did impact the effort participants reported putting forth these classes. As predicted in Hypothesis 2b, participants who attended classes whose descriptions included gain framing *reported* exerting more effort in the class compared to participants who attended classes whose descriptions included loss framing. This result is perhaps more in line with the aforementioned research regarding the instilling of mindsets, as researchers have found evidence suggesting that individuals' mindsets can produce physiological effects – i.e., if individuals believe an activity to be “exercise,” they may benefit from the perception of that activity now being viewed as exercise (Crum & Langer, 2007). Thus, participants in our study who chose to attend gain-framed classes may have indeed perceived benefits of attending said class, and this perception may have prompted them to *feel* that they put forth more effort in the class in order to attain the possible benefits associated with attending the class. Therefore, though participants' mindsets (i.e., their perception of and expectations for the class they selected) did not alter their enjoyment of the class, the instilled mindset did seem to influence the amount of effort participants put forth in classes – or at least their perception of the amount of effort they put forth.

While study 1 sought to investigate which combination of framing type (gain vs. loss) and framed content (appearance vs. health) inspired the highest selection rates and produced the highest self-reported (i.e., *subjective*) enjoyment and effort, study 2 was conducted to see if exposure to certain frames affected *objective* performance in fitness classes. As such, the primary goal of study 2 was to determine whether individuals exerted more effort (as measured via accelerometry) when they viewed class descriptions that featured different framing combinations (appearance gain, appearance loss, health gain, health loss) or no framing at all (control).

Based on Crum and Langer's (2007) study demonstrating the power of mindsets in producing physiological changes when individuals believed themselves to be getting more exercise, it was hypothesized (in Hypothesis 3) that individuals who viewed a class description that featured appearance gains (i.e., those who had an "appearance gain" mindset instilled and were provided with the expectation that the class they are attending can produce appearance-related benefits) would expend more energy compared to individuals in alternative framing conditions. This hypothesis was not supported, however, as participants' objective energy expenditure (i.e., calories expended and minutes spent in MVPA during the exercise class) did not differ amongst the framing conditions. This result was certainly unexpected, as it was speculated that instilling a mindset immediately prior to participating in a fitness class (participants read the class descriptions shortly before the class began) would increase the likelihood that the mindset would be "in tact" during the class and that the class outcomes (i.e., potential benefits of participating and/or potential losses of not participating) would be salient for individuals as they completed the class. This was not the result observed, however, suggesting that exposure to a short and simple framing manipulation may not have been enough to truly alter participants' mindsets and influence their physiological effort during the class.

Interestingly, in addition to participants' objective effort (i.e., calories expended and minutes spent in MVPA) being unaffected by the framing manipulation in study 2, participants' subjective (i.e., self-reported) effort was similarly not influenced by the type of frame the participant viewed prior to completing the fitness class. This is noteworthy, as participants in study 1 did in fact report differences in exertion based on the framing of the class they selected (i.e., participants who selected gain-framed classes to attend reporting exerting more effort than those who selected loss-framed classes to attend). Perhaps requiring participants to choose a

class (as was the case in study 1) prompted participants to more carefully read the class descriptions – i.e., as participants possessed autonomy over their course selection, it seems likely that participants would closely read the class descriptions and thoughtfully consider which class they would like to attend. Accordingly, this greater attention to the class descriptions may have promoted the instillation of a mindset, which then led to the difference in self-reported exertion among participants in study 1 that selected differently-framed classes to attend. In study 2, however, all participants were required to participate in the same class, and participants viewed the class description (i.e., were exposed to the framing manipulation) immediately prior to beginning the class. Simply put, participants in study 2 had no autonomy with regard to the class they attended, and the description they read merely explained the class they would soon be completing. Based on the discrepancy between subjective effort among participants in the different framing conditions in study 1 compared to study 2, it seems probable that participants in study 2 may not have read the framed descriptions as carefully – especially given their lack of control with regard to class selection – and therefore may not have instilled a mindset in the same way that participants seemed to in study 1.

Additionally, It is also possible that participants' effort was not influenced by the framing manipulation in study 2 because of the standardized nature of the class participants were required to attend; participants in study 2 completed a pre-choreographed, highly standardized barbell class such that all participants completed the exact same number of the exact same exercises at the exact same rate/pace. Accordingly, there may not have been much opportunity for participants to expend significantly different amounts of effort given the structure of the class. It is possible that if participants engaged a less controlled class format (e.g., High Intensity Interval Training), effort may be influenced by a framing manipulation.

Interestingly, though participants' effort in study 2 was unaffected by the framing condition (perhaps due to lack of autonomy or the standardized nature of the class), participants' enjoyment of the class was influenced by the framing in study 2 (while framing had no influence on participants' enjoyment of the class they selected in study 1). This suggests that autonomy and class format may play a more essential role in modulating effort compared to influencing enjoyment, where other factors – e.g., recency of frame exposure – may be more impactful. In study 2, participants were exposed to the framing manipulation immediately prior to completing the fitness class. It seems likely that seeing the framing manipulation at this time (i.e., directly before the class began) increased the saliency of the frame and instilled a mindset that promoted higher enjoyment for participants who viewed gain-framed descriptions. As participants reported lower enjoyment when the class descriptions utilized loss framing compared to when the class descriptions included no framing, it also seems likely that loss framing – which informed participants of the benefits they would lose out on if they did not attend the class – could have caused some reactance given that people were indeed required attend the class (i.e., they were not actually given the choice to miss the class and therefore were not in a position to be missing out on the class' benefits). As such, participants may have been off put by seeing a class description that informed them of the negative consequences associated with missing a class they would in fact be momentarily completing.

Taken together, studies 1 and 2 suggest a clear influence of message framing on individuals' class selection tendencies but a murkier role of message framing on individuals' outcomes in exercise classes. In study 1, individuals' *attendance behavior* was influenced by the framing condition (i.e., individuals were most likely to choose to attend classes that were framed in terms of appearance gains). Participants in study 1 also reported exerting more effort in classes

whose descriptions utilized gain framing. In study 2, however, neither participants' reported (i.e., subjective) effort nor *physiological performance* (i.e., physical exertion) was affected by the framing condition (i.e., participants seemingly expended the same amount of energy regardless of the frame to which they were exposed). Accordingly, these two studies suggest that framing may indeed influence which classes are most appealing to potential participations – and, accordingly, which class descriptions inspire the greatest attendance (i.e., selection) rates – but framing class descriptions may not alter energy expenditure in those classes.

Strengths

These two studies, especially when considered together, have several noteworthy strengths. First, while myriad studies have investigated the use of message framing for promoting physical activity at the individual level (i.e., encouraging individuals to participate in physical activity on their own), these two studies specifically focused on impact of message framing on individuals' participation in – and performance during – group fitness classes. In fact, these studies were the first to test the impact of message framing on actual attendance behavior for group fitness classes and assess whether exposure to differently-framed class descriptions affects performance during fitness classes. As fitness classes are a popular exercise option – 36 percent of regular exercisers report participating in group fitness classes (Nielsen, 2014) – investigating factors that may make group fitness classes more appealing (e.g., the framing of class descriptions) is certainly valuable.

In addition to being a prevalent exercise option for individuals, group fitness classes also offer auxiliary benefits compared to individual exercise options (i.e., exercising alone), such as social support, perceived accountability, and enhanced exercise adherence (Estabrooks, 2000; Carron et al., 1996; Spink & Carron, 1992). Participation in group fitness classes has also been

associated with lower perceived stress and improved quality of life compared to exercising alone or not exercising, suggesting that group fitness classes may promote additional mental health benefits compared to other exercise options (Yorks et al., 2017). Considering both the popularity of group fitness classes and the advantages offered by these classes, determining the most effective ways to promote group fitness classes via the use of message framing could potentially foster greater physical and mental health for many individuals.

Additionally, the present research boasts high construct validity and high external validity, both of which increase the value and applicability of the results. These results, particularly from study 1, are directly applicable to gyms/ health clubs/recreation centers as they could utilize this information to frame their classes in the most effective manner to attract participants. The manner in which participants interacted with class information (i.e., class descriptions) in study 1 was intentionally highly representative of the manner in which consumers would interact with group fitness class information in the external world – that is, participants viewed an assortment of class descriptions and selected the class of their choosing, much like consumers would see a variety of class offerings at a local gym/health club/recreation center and would select which class(es) they would like to attend. Furthermore, as participants in study 1 actually attended the class of their choosing, the construct validity is exceptionally high, as study 1 was designed to measure attendance patterns and did, in fact, measure actual attendance rates of differently-framed classes rather than *intention* to attend, for example.

Likewise, study 2 was designed to measure performance in group fitness classes and objectively measured performance via the use of accelerometry in addition to including subjective measures, allowing for increased measurement accuracy with regard to the construct of “performance.” In fact, accelerometry is considered the gold standard for collecting objective

physical activity data, as the devices demonstrate consistently high validity at capturing data in this domain (for review, see Plasqui et al., 2013), thereby boosting the construct validity in study 2 as well.

Study 2 also benefited from a large amount of control that increased the internal validity of the study. While four separate classes were taught as part of study 2 (to allow adherence to studio occupancy regulations at the Student Recreation Center), the exact same class was taught by the same instructor across four weeks such that the four separate classes were offered on the same day and at the same time during a one-month period. Additionally, the class that participants completed was a highly standardized barbell class (i.e., Les Mills' "BODYPUMP" – a 45-minute barbell class that is pre-choreographed and, accordingly, contains the exact same exercises in the exact same order during every class). The instructor was also directed to avoid including any "coaching" (i.e., verbal cues) that contained any sort of framed content during the class, such that participants would not be exposed to additional (and possibly inconsistent) framing during the class. Furthermore, participants were randomly assigned to their framing condition immediately prior to completing the class – that is, each of the four classes contained participants in different framing conditions, thereby eliminating the potential of slight variations in the four classes manufacturing differences among the framing conditions.

Limitations

While these studies experimentally tested the influence of message framing on group fitness class attendance and performance in a realistic and directly applicable fashion, the research did rely on college students who voluntarily elected to participate in research related to group fitness classes. Although the study sample represents a demographic segment that is highly involved in group fitness classes (i.e., a young, primarily female sample), it is important to

recognize that these results may not generalize to other populations and settings. It is also important to note that these individuals were seemingly already interested in group fitness classes (as the study description posted on the psychology research pool's website indicated that participation in this study would include participation in a group fitness class); therefore, while framing classes in terms of appearance gains seemed to attract individuals to fitness classes in study 1, this is true for individuals who were already interested in group fitness classes. It is possible that including appearance-related gains in class descriptions may not increase attendance rates among individuals who are inherently not as interested in participating in group fitness classes.

While study 1 contained a large sample of college students (and additionally did not require random assignment to condition due to the primary dependent measure of class selection), study 2 suffered from a smaller sample size that may have hindered the ability to detect small effects. Power analyses for study 2 indicated that approximately 39 participants would be needed for each of the five conditions given a medium effect size ($f = .25$). Unfortunately, only 131 participants completed study 2 (ranging from 25 through 28 participants per condition) due to pre-study attrition (i.e., some individuals signed up for study 2 but failed to attend their scheduled class session) and restrictions in instructor/studio availability. Because of the large variation in individuals' energy expenditure – specifically caloric expenditure – during the same group fitness class and the inadequate sample size, it is likely that small to medium effects were impossible to detect. Notably, for instance, the appearance loss condition expended the most calories (169.96), while the health gain condition had the lowest expenditure of 147.20 calories during the class. This 22.76-calorie difference, though not statistically significant, may indicate a small effect of framing that could be potentially detected in a larger sample (though this may be unlikely given the extremity of the non-significant effect).

Future Directions

These studies were the first to consider the impact of message framing on attendance of – and performance during – group fitness classes. Study 1 found that individuals were overwhelmingly most likely to choose to attend classes whose descriptions featured appearance-related gains. In the future, it would be interesting (and important) to determine whether this pattern holds in other settings. For instance, it would be valuable to assess whether classes offered at gyms/health clubs/recreation centers are indeed more popular if their descriptions include appearance-related gains. Accordingly, future research should consider assessing the effect of message framing on class attendance in settings where group fitness classes are offered by altering class descriptions that are already in place and measuring the impact of including differently-framed messages.

Additionally, in study 2, participants were randomly assigned to a framing condition to assess the impact of message framing on individuals' energy expenditure during a fitness class. While this study design was implemented to bolster experimental control and minimize confounding factors, future studies could consider a differing design in which participants were able to select a frame rather than being assigned a frame – i.e., perhaps the autonomy of class selection (as was present in study 1) would increase the likelihood that participants would carefully read the frame, thereby instilling the related mindset and producing differences in energy expenditure due to the increased saliency of the frames.

Participants in study 2 also only had one “exposure point” – that is, participants read the frame only one time before the class commenced – and, as mentioned, participants were intentionally not exposed to any additional verbal framing during the class as all classes contained participants from all five framing conditions. Again, while this design element was

necessary for this particular experimental structure, future studies should consider implementing “continual frame reminding” – i.e. instructors could give encouragement throughout the class that fit the specific framing condition. For instance, if participants were taking part in an appearance gain class, the instructor would give verbal reminders throughout the class that would increase/reinforce the frame’s saliency (e.g., “That’s it! Squeeze those abs and get that six pack!”). This continual frame reminding would be more representative of what occurs in a typical group fitness class, as instructors aim to inspire and motivate individuals during the entirety of the class. The continual frame reminding would also, of course, increase the saliency of the frame throughout the class. It is highly possible that individuals in study 2 simply did not have enough exposure to the framing condition for the frame to remain salient for the duration of the class. Perhaps repeated exposure to the frames would produce difference in individuals’ performance during classes if different frames were continually featured rather than simply viewed once before the start of a class.

Although the group differences in caloric expenditure in study 2 were statistically non-significant, perhaps continual frame exposure would inspire a greater mindset change and, therefore, would produce significant group differences in caloric expenditure among framing conditions. Given the pattern of the (albeit statistically non-significant) group differences in study 2 (i.e., appearance loss participants expending the most calories and health gain participants expending the least), determining whether continual frame exposure produces group differences would be particularly impactful if a framing that is less likely to inspire attendance (i.e., appearance loss) is actually the best motivator of exertion once an individual starts a class. This information could be useful for gyms/health clubs/recreation centers, as they should consider that certain frames (i.e., appearance gain) should be used to advertise classes, while

other frames (i.e., appearance loss) may be more effective at motivating participants and inspiring effort during the classes themselves.

Conclusions

The purpose of this research was to determine the influence of message framing on individuals' attendance of group fitness classes and, furthermore, to assess the impact of message framing on individuals' performance during group fitness classes. In these two studies, I found that message framing greatly impacted attendance rates of fitness classes – individuals were significantly more likely to attend classes whose descriptions featured appearance-related gain framing – but message framing did not produce a clear effect on individuals' performance in these fitness classes. Future research should continue to investigate how message framing may influence individuals' interest in and performance during group fitness classes and should consider stronger (i.e., more sustained) framing interventions to understand how framing exposure may take place in naturally occurring fitness class environments and the effect that sustained framing exposure may have on individuals' experiences during fitness classes.

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APPENDIX A

Study 1 Class Framings

Class 1

Frame Type	Class Description
Appearance Gain	<i>Doing cardio helps you burn fat so that you can look leaner and more attractive. Get your heart rate going in this simple and fun high-volume cardio class that uses a variety of exercises and equipment to keep your workout fun and exciting as you make yourself look more toned!</i>
Appearance Loss	<i>Skipping cardio puts you at risk for accumulating excess fat and looking soft and less attractive. Get your heart rate going in this simple and fun high-volume cardio class that uses a variety of exercises and equipment to keep your workout fun and exciting as you prevent yourself from losing muscle definition!</i>
Health Gain	<i>Doing cardio enhances your heart health and improves your cardiovascular functioning. Get your heart rate going in this simple and fun high-volume cardio class that uses a variety of exercises and equipment to keep your workout fun and exciting as you make yourself healthier!</i>
Health Loss	<i>Skipping cardio puts you at risk for poorer heart health and lower cardiovascular functioning. Get your heart rate going in this simple and fun high-volume cardio class that uses a variety of exercises and equipment to keep your workout fun and exciting as you prevent yourself from becoming unhealthy!</i>

Class 2

Frame Type	Class Description
Appearance Gain	<i>Make your body look more toned! This class blasts calories and provides noticeable weight loss and muscle toning improvements in a short amount of time. This interval style class uses simple but effective exercises that boost the heart rate. Come try out this class that can help you tighten up and get that 6-pack.</i>
Appearance Loss	<i>Don't let your body get flabby! Skipping this class takes away a chance to blast calories and achieve noticeable weight loss and muscle toning improvements in a short amount of time. This interval style class uses simple but effective exercises that boost the heart rate. Missing out on this class takes away a chance to tighten up and get that 6-pack.</i>
Health Gain	<i>Improve your body's health! This class provides noticeable cardiovascular and strength improvements in a short amount of time. This interval style class uses simple but effective exercises that boost the heart rate. Come try out this class can help improve your overall health and body functioning.</i>
Health Loss	<i>Don't let your body's health dwindle! Skipping this class takes away a chance to see noticeable cardiovascular and strength improvements in a short amount of time. This interval style class uses simple but effective exercises that boost the heart rate. Missing out on this class takes away a chance to improve your overall health and body functioning.</i>

Class 3

Frame Type	Class Description
Appearance Gain	<i>This is an intense, ever-changing class designed to keep your body on its toes. It is an ultimate challenge that sculpts your body and enhances muscle definition while blasting fat from troublesome areas. Come improve your appearance in this challenging and efficient class!</i>
Appearance Loss	<i>This is an intense, ever-changing class designed to keep your body on its toes. It is an ultimate challenge that prevents fat from accumulating in troublesome areas, thereby decreasing your muscle definition. Don't let your appearance deteriorate by missing this challenging and efficient class!</i>
Health Gain	<i>This is an intense, ever-changing class designed to keep your body on its toes. It is an ultimate challenge that strengthens your body and enhances cardiovascular health while improving muscle functioning. Come improve your health in this challenging and efficient class!</i>
Health Loss	<i>This is an intense, ever-changing class designed to keep your body on its toes. It is an ultimate challenge that prevents your cardiovascular health and muscle functioning from decreasing. Don't let your health deteriorate by missing this challenging and efficient class!</i>

Class 4

Frame Type	Class Description
Appearance Gain	<i>This class combines strength and cardio moves and uses a variety of equipment including hand weights, medicine balls, and resistance bands to keep your training interesting and help you increase your muscle definition. Come to this class to tone your body and leave class looking good!</i>
Appearance Loss	<i>This class combines strength and cardio moves and uses a variety of equipment including hand weights, medicine balls, and resistance bands to keep your training interesting and help you avoid losing muscle definition. Don't skip this class and let yourself get flabbier and less attractive!</i>
Health Gain	<i>This class combines strength and cardio moves and uses a variety of equipment including hand weights, medicine balls, and resistance bands to keep your training interesting as you improve your health. Come to this class to enhance your body's health and leave class feeling full of energy!</i>
Health Loss	<i>This class combines strength and cardio moves and uses a variety of equipment including hand weights, medicine balls, and resistance bands to keep your training interesting and help you avoid losing body functioning. Don't skip this class and let your body's health worsen and make you feel less energetic!</i>

APPENDIX B

Study 1 Latin Square Design – Class Type by Framing Condition

	Appearance Gain	Appearance Loss	Health Gain	Health Loss
Class 1	Version 1	Version 2	Version 3	Version 4
Class 2	Version 4	Version 1	Version 2	Version 3
Class 3	Version 3	Version 4	Version 1	Version 2
Class 4	Version 2	Version 3	Version 4	Version 1

Note: Four different class description sheets were manufactured for participants, such that each participant viewed a unique class containing each type of frame. For example, a participant in Version 1 saw an appearance gain version of class 1, an appearance loss version of class 2, a health gain version of class 3, and a health loss version of class 4.

APPENDIX C

Self-Efficacy for Exercise Questionnaire (SEEQ)

Below is a list of things people might do while trying to increase or continue regular exercise. We are interested in exercises like running, swimming, brisk walking, bicycle riding, or aerobics classes.

Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months.

Please select one number for each question. How sure are you that you can do these things?
(From 1 = I know I cannot to 5 = I know I can)

1. Get up early, even on weekends, to exercise.
2. Stick to your exercise program after a long, tiring day at work.
3. Exercise even though you are feeling depressed.
4. Set aside time for a physical activity program; that is, walking, jogging, swimming, biking, or other continuous activities for at least 30 minutes, 3 times per week.
5. Continue to exercise with others even though they seem too fast or too slow for you.
6. Stick to your exercise program when undergoing a stressful life change (e.g. divorce, death in the family, moving).
7. Attend a party only after exercising.
8. Stick to your exercise program when your family is demanding more time from you.
9. Stick to your exercise program when you have household chores to attend to.
10. Stick to your exercise program even when you have excessive demands at work.
11. Stick to your exercise program when social obligations are very time consuming.
12. Read or study less in order to exercise more.

APPENDIX D

7-Day Physical Activity Recall (7D-PAR)

In the last week (7 days), how many hours did you spend doing the following activities?

Strenuous exercise (heart beats rapidly). Examples: biking fast, aerobics, jogging, basketball swimming laps, soccer, rollerblading

None

Less than 1 hour

1-2 hours

2.5-4 hours

4.5-6 hours

More than 6 hours

Moderate exercise (not exhausting). Examples: walking quickly, easy bicycling, volleyball, skiing, dancing, skateboarding, snowboarding

None

Less than 1 hour

1-2 hours

2.5-4 hours

4.5-6 hours

More than 6 hours

Mild exercise (little effort). Examples: walking slowly, bowling, golf, fishing, snowmobiling

None

Less than 1 hour

1-2 hours

2.5-4 hours

4.5-6 hours

More than 6 hours

APPENDIX E

Concern for Health and Appearance Scale

Please indicate how much you agree with the following statements (from 1 = strongly disagree to 7 = strongly agree).

1. I reflect a lot about my health.
2. I am very self-conscious about my health.
3. I am constantly examining my health.
4. I am NOT very involved with my health.

Please indicate how much you agree with the following statements (from 1 = strongly disagree to 7 = strongly agree).

1. I reflect a lot about my appearance.
2. I am very self-conscious about my appearance.
3. I am constantly examining my appearance.
4. I am NOT very involved with my appearance.

APPENDIX F

Study 1 Post-Class Questionnaire

4. Signature of instructor: _____

5. Using the provided scale, how much did you enjoy the class?

1 2 3 4 5

Not at all Very much

6. How challenging did you find this class?

1 2 3 4 5

Not challenging at all Extremely challenging

7. How much effort did you put into the class?

1 2 3 4 5

Not effort at all Maximum effort

8. Would you attend this class again? (Circle one:)

Yes No

9. Please rank the likelihood of the following four outcomes occurring if you were to attend this class regularly (from 1 = most likely to occur and 4 = least likely to occur). Write the number in the line to the left of the outcome.

I'll improve my appearance

I'll prevent my appearance from worsening

I'll improve my health

I'll prevent my health from worsening

APPENDIX G

Study 2 Class Framings

Class: Barbell

Frame Type	Class Description
Appearance Gain	<i>Make your body look more toned! This class blasts calories and provides noticeable weight loss and muscle toning improvements in a short amount of time. This barbell class uses simple but effective exercises that boost the heart rate. Come try out this class that can help you tighten up and get that 6-pack.</i>
Appearance Loss	<i>Don't let your body get flabby! Skipping this class takes away a chance to blast calories and achieve noticeable weight loss and muscle toning improvements in a short amount of time. This barbell class uses simple but effective exercises that boost the heart rate. Missing out on this class takes away a chance to tighten up and get that 6-pack.</i>
Health Gain	<i>Improve your body's health! This class provides noticeable cardiovascular and strength improvements in a short amount of time. This barbell class uses simple but effective exercises that boost the heart rate. Come try out this class can help improve your overall health and body functioning.</i>
Health Loss	<i>Don't let your body's health dwindle! Skipping this class takes away a chance to see noticeable cardiovascular and strength improvements in a short amount of time. This barbell class uses simple but effective exercises that boost the heart rate. Missing out on this class takes away a chance to improve your overall health and body functioning.</i>
Control	<i>Barbell is the original when it comes to weight training classes. This barbell class uses simple but effective exercises that boost the heart rate.</i>

APPENDIX H

Study 2 Post-Class Questionnaire

Actigraph # _____

Fitness Class Preferences 2 (Study #47) Post-Class Questionnaire

Name of participant: _____

1. Using the provided scale, how much did you enjoy the class?
(0 = not at all, 10 = very much.) Circle your response below.

0 1 2 3 4 5 6 7 8 9 10

2. Using the provided scale, how challenging did you find this class?
(0 = not challenging at all, 10 = extremely challenging.) Circle your response below.

0 1 2 3 4 5 6 7 8 9 10

3. Using the provided scale, how much effort did you exert during this class?
(0 = no effort/exertion, 10 = maximum effort/exertion.) Circle your response below.

0 1 2 3 4 5 6 7 8 9 10

4. Would you attend this class again? (Circle one.)

Yes No

5. Please rank the likelihood of the following four outcomes occurring if you were to attend this class regularly (from 1 = most likely to occur and 4 = least likely to occur). (I.e., write a 1 by the outcome you think is most likely to occur, a 2 by the outcome you think is next likely to occur, etc.) Write the number in the line to the left of the outcome.

_____ I'll improve my appearance

_____ I'll prevent my appearance from worsening

_____ I'll improve my health

_____ I'll prevent my health from worsening

6. Have you ever attended a class led by this instructor (Vanessa) before? (Circle one.)

Yes

No

7. Have you ever attended a barbell class like this before? (Circle one.)

Yes

No

8. What do you think the purpose of this study was? (Write your response below.)