

Research Article

Physical Activity Advertisements That Feature Daily Well-Being Improve Autonomy and Body Image in Overweight Women but Not Men

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The reasons for exercising that are featured in health communications brand exercise and socialize individuals about why they should be physically active. Discovering which reasons for exercising are associated with high-quality motivation and behavioral regulation is essential to promoting physical activity and weight control that can be sustained over time. This study investigates whether framing physical activity in advertisements featuring distinct types of goals differentially influences body image and behavioral regulations based on self-determination theory among overweight and obese individuals. Using a three-arm randomized trial, overweight and obese women and men (aged 40–60 yr, $n = 1690$) read one of three ads framing physical activity as a way to achieve (1) better health, (2) weight loss, or (3) daily well-being. Framing effects were estimated in an ANOVA model with pairwise comparisons using the Bonferroni correction. This study showed that there are immediate framing effects on physical activity behavioral regulations and body image from reading a one-page advertisement about physical activity and that gender and BMI moderate these effects. Framing physical activity as a way to enhance daily well-being positively influenced participants' perceptions about the experience of being physically active and enhanced body image among overweight women, but not men. The experiment had less impact among the obese study participants compared to those who were overweight. These findings support a growing body of research suggesting that, compared to weight loss, framing physical activity for daily well-being is a better gain-frame message for overweight women in midlife.

1. Introduction

Sixty-eight percent of the US adult population is overweight or obese [1] and thus at increased risk of developing debilitating and costly illnesses, including, diabetes, cardiovascular disease, and depression. While modest weight loss improves health [2], the vast majority of individuals who lose weight

eventually gain it back [3, 4]. Understanding how to best promote weight loss and weight control that can be sustained is a top public health priority. Sustained physical activity participation is a critical component of weight loss maintenance [5]. In addition, regular physical activity reduces the risk of developing cardiovascular disease, diabetes, osteoporosis, and some cancers and improves quality of life [6–11]. Despite

these numerous benefits and over thirty years of behavioral research and messages in the media educating people about physical activity benefits, most individuals do not sustain physically active lives [12]. While most individuals are aware of the many benefits physical activity brings, this knowledge is not sufficient to motivate active lifestyles [13].

For both women and men, the typical messages and communications emphasize physical activity primarily for health and/or weight control benefits [14–16]. Furthermore, exercise is typically prescribed to patients for its weight and health value rather than as a good way to enhance mood or quality of life [17]. When physicians recommend exercise to their patients it is usually within the specific context of the need to diet and lose weight [18]. Thus, the dominant messages in society have framed and branded physical activity primarily as a way to lose weight, prevent disease, and age with good health [19].

How physical activity benefits are framed in health communications and prescribed by clinicians actually socialize individuals about physical activity [20–22]. *They teach people about the goals they should strive to achieve from being physically active (e.g., the reasons why they should participate).* Goals are the starting point of any behavior [23]. They direct and energize behavior, with some goals energizing behavior better than others [24–27]. Behavioral goals and motives influence the quality of motivation that develops and are central to long-term sustainability [28–31]. Thus, to optimally promote sustainable physical activity, it is crucial to identify *which frames* foster optimal motivational responses toward physical activity and result in goals that are energizing and motivationally potent [19, 29].

Self-determination theory (SDT) has not been previously studied as an explanatory motivation/behavior framework in the exercise/physical activity framing literature as far as we know. Yet, we believe it holds great potential to identify optimal frames for physical activity marketing and promotions. SDT proposes that socialization to a behavior like physical activity occurs within social contexts that either support or undermine autonomy, one of three innate human needs [32]. Feeling autonomous, or self-determined, toward physical activity is important because it helps individuals internalize the value of being physically active so they can integrate it into their selves and lives. Thus, the real objective is for individuals to integrate physical activity regulations *within their sense of self and values* rather than *behavior change, per se* [27].

SDT pays attention to the motives “behind” a behavioral goal—the reasons underlying the decision to become more physically active (or adopt any behavior) [33]. SDT refers to these motives as “regulations” and broadly distinguishes between “controlled” and “autonomous” regulations. Controlled regulations refer to initiating a behavior to fulfill an external demand or a socially constructed contingency (external regulation) and/or also reflect an individual “partially internalizing” the value of being active but not in a deeper sense where it is truly accepted as one’s own (introjected regulation). Introjection-based behaviors are done to avoid guilt and shame and to attain feelings of worth. They often feel like a “should” or an obligation [34]. In

contrast, autonomous regulations reflect acting with a full sense of volition and choice when initiating an activity. When individuals experience autonomy toward being physically active they value it (identified regulation) and may enjoy and/or receive positive feelings and satisfaction from the act of being physically active (intrinsic regulation).

SDT offers a helpful framework to understand the counterintuitive notion that initiating physical activity with goals related to “losing weight” may, ironically, undermine the ultimate aim to motivate sustainable participation and weight control [33]. Weight loss goals for physical activity embed pressures based on sociocultural norms that encourage women to internalize a sexualized, third-person view of themselves [16, 35–38].

We argue that losing weight as a physical activity goal, in general, is inextricably connected to appearance norms and thinness pressures in our culture, especially for women. Because of that it is difficult to separate out “attractiveness” and “thinness” pressures and goals from a weight loss goal for women. For example, one study validating an exercise motive scale reported that separate “appearance” and “weight loss” items were highly correlated [39]. In addition, we conducted a cross-sectional mixed-method study with 59 midlife women, most of whom were well-educated European Americans (mean age = 45.6 years). They were asked to imagine being physically active for two minutes and then write down the first associations, words, and phrases that came to mind. We coded these data as either “body-shape” or “non-body-shape” according to what words they wrote down [40]. Participants who noted ideas like calories, losing weight, and so forth were categorized as having “body-shape” motives (44%). Those who did not note those types of concepts were placed into the “non-body-shape” motive category (56%). Those who exercised with body-shape motives self-objectified more (e.g., perceiving oneself from a third-person perspective: “How do I look?” instead of “How do I feel?”) compared to participants who exercised for non-body-shape goals. Higher self-objectification among participants with weight-related goals indicates that they had more greatly internalized cultural beauty norms and pressures compared to the other participants [35]. The participants with body-shape motives were also 37% less physically active than those with non-body-shape motives ($P < 0.01$).

We later took a random sample of 400 working women (40–60 yr) that resulted in 262 participants [41]. Using a person-centered method of analysis with a cross-sectional study design, cluster analysis identified participants’ most important physical activity goals. This sample of overweight women in midlife reported exercising for the following five reasons: (1) sense of well-being; (2) weight loss; (3) health benefits; (4) stress reduction; and (5) weight maintenance/toning. Follow-up analyses on these goals/reasons for exercise suggested that weight-related goals were associated with more external and less intrinsic behavioral regulation compared to goals related to stress reduction and sense of well-being ($P < 0.05$).

Using this five-goal solution we studied participants’ exercise participation over one year ($n = 156$). This study

fit a linear mixed model to the data to investigate the fixed effects of physical activity goals on physical activity participation, controlling for BMI and social support. There were significant differences between participants with distinct types of goals on physical activity participation over time (i.e., baseline, one-month, and one-year after baseline), controlling for the effects of BMI and social support. Participants with weight loss goals participated in 34% and 27% less physical activity than those with sense of well-being and stress reduction goals, respectively [24].

Different developmental foci and tasks influence which types of physical activity goals are more or less salient and influential for individuals of distinct ages [20, 42, 43]. Young adults are concerned with establishing intimate relationships [44]. Because of that, appearance/weight-related goals may motivate physical activity because it is in service of a very salient life-stage task [45]. In contrast, women in midlife have family caregiving responsibilities (often children and parents) and jobs and also likely have more goals and priorities competing for time with physical activity compared to younger, college-aged women [24]. Thus, being active in order to lose weight might not make physical activity compelling enough to trump midlife women's other competing daily responsibilities and life tasks [31]. The body of research just presented suggests that being physically active with weight loss goals intersects cultural pressures and is associated with decreased exercise participation, non-optimal regulations, and self-objectification and may also negatively impact body image, especially among overweight women in midlife [24, 30, 32, 40, 41, 46, 47].

Because of these negative effects and lack of sustainable outcomes, some have called to shift the focus and promotion of physical activity from body weight to *health* [48]. Yet, framing and promoting physical activity to achieve better health is more complex than it seems. Some programs of research suggest that "health" as a goal, in general, is *autonomous*; they also consider health goals for exercise to be *intrinsic* [29, 49, 50]. We too had considered health goals for exercise as intrinsic. However, our previous person-centered research suggested that among overweight women in midlife (40–60 yr) who work full time, those who exercised with goals related to health experienced them as more controlling and less intrinsic than participants who had exercise goals related to stress reduction and well-being [41]. Thus, framing physical activity primarily for health benefits, as is typically done, might undermine participation because exercising to improve health may exert pressure, even unconsciously [51].

To better understand this contention, it is helpful to contextualize a "health" goal for physical activity within the American cultural context. Cultural messages about the importance of doing things to "be healthy" dominate the media. Exercising as a way to prevent disease has turned exercise into a moral imperative, something else that we "should" be doing [52, 53]. Furthermore, the manner in which professionals in the health care system characterize a behavior influences how individuals perceive and construe that behavior [54]. Exercise is typically prescribed to patients within the health care system for its medical and health value [17]. Moreover, in medical encounters with patients,

practitioners tend to be controlling [55–57]. If practitioners prescribe physical activity to patients as a way to improve health in controlling ways, this creates a context that likely undermines feelings of autonomy toward physical activity and results in patients developing controlled regulations toward this behavior. In recent years, there has even been a movement and branding campaign by leading exercise and medical organizations advocating that clinicians explicitly discuss exercise as "medicine" with their patients [58]. In support of this idea, one study reported that a "health pressures" exercise motive was positively correlated with external behavioral regulation ($0.35, P < 0.01$) [30].

Another reason that health-related goals for physical activity might be controlling and thus nonoptimal for ongoing participation is that efforts to be healthy have been shown to be intertwined with beauty and thinness norms among overweight and obese individuals [59]. One study conducted interviews with 42 overweight and obese participants to investigate how they understood their health and beauty weight loss motives and the relationship between the two. Interviews indicated that participants conflated (e.g., interrelated) beauty and health motives in three ways. The study participants considered depictions of beauty ideals as depictions of health. They used beauty as an indicator of being healthy and also as a motivator for health goals. Another research also found a significant correlation ($0.45, P < 0.001$) between health/fitness and appearance/weight exercise motives among midlife adults who work in the north of England (BMI not reported) supporting the idea that the concepts of health and weight/beauty/attractiveness are interconnected in people's minds [30].

Thus, for overweight and obese individuals it might be especially hard to disentangle health as a goal for exercise from the prevalent beauty and weight/thinness ideals that accompany health content and images in the media—a major form of our socialization [22]. Having health intertwined with weight, in this way, might embed health-related exercise goals with implicit, controlling meanings related to cultural beauty/thinness pressures and result in similar negative emotional and behavioral outcomes from having weight loss goals for exercise as previously discussed above. In fact, our program of research on overweight women, described earlier, does suggest that being physically active to achieve health-related goals is associated with worse outcomes in behavioral regulation, commitment, and longitudinal participation compared to goals related to well-being and quality of life [19, 24, 41]. Furthermore, another investigation we conducted showed that participants with "superordinate-level" goals (e.g., the higher order reason for one's goal) for exercising related to either "current health" or "future healthy aging" participated significantly less compared to participants having superordinate-level goals related to enhancing "quality of life [19]."

We have proposed it would be strategic to rebrand physical activity on a societal level by reframing it as a primary way individuals can enhance their sense of well-being and daily quality of life [19]. Unlike exercising with goals to lose weight and/or improve health, the results from physical

activity aiming to enhance daily well-being are immediately experienced during and/or directly following participation.

A growing body of research shows that smaller, immediate rewards are more motivating than larger, more distant rewards [60, 61]. Other programs of research on women also support our contention that sustainable participation is connected to a desire to improve daily quality of life. One study of overweight women in midlife identified characteristics of female participants who adhered after an exercise intervention ended compared to those who did not adhere [62]. Those who adhered reported being motivated by “an intrinsic desire to improve their quality of life” and de-emphasized body image as their exercise goal. In contrast, those who did not adhere emphasized body image and weight as the goals they aimed to achieve from exercising. This retrospective study and our previous research support the notion that daily well-being goals might better facilitate sustainable physical activity participation among overweight midlife women. Yet to more deeply understand the continuum of processes related to producing sustainable physical activity motivation and behavior, it is important to investigate *the beginning* of this motivation-behavior process—how different frames about the benefits of physical activity immediately influence individuals’ feelings about and responses toward being physically active.

Framing research investigates which ways of conveying information about a particular behavior optimally motivates individuals to practice it [54, 63]. In general, much of framing research on physical activity has centered on differences between “gain-framed” and “loss-framed” messages. Gain-framed messages focus on the benefits of adopting physical activity while loss-frame messages target the costs of failing to adopt physical activity. A recent review and meta-analysis of physical activity messages reported that gain-frame messages were more persuasive than loss-framed messages on physical activity participation [63, 64]. SDT may help us understand *which gain-frame messages* support or undermine the development of high-quality motivation necessary to drive physical activity and weight control that can be maintained.

This study aims to expand the framing literature by using SDT as the posited mechanistic framework underlying sustainable physical activity and weight control [27, 65]. This is the first study we know of that uses constructs from SDT to investigate the immediate framing effects from reading distinct “gain-frame” messages promoting physical activity.

The broad objective of this study is to investigate whether a “gain-framed” message featuring daily well-being causes immediate and different effects on behavioral regulations and body image compared to “gain-frame” messages featuring health or weight loss, and whether this differs by gender and BMI among overweight and obese individuals. Based on the body of research just reviewed, we hypothesized that overweight and obese men and women reading the advertisements featuring daily well-being would report decreased controlled regulation and increased autonomous regulation compared to those reading advertisements featuring health or weight loss frames for being physically active. Because women experience much greater pressure to be thin and

lose weight [35, 66], we also hypothesized that gender would moderate the framing effects on body image and that women reading the daily well-being advertisement would report better body image compared to those reading weight loss advertisement (but not men).

2. Method

2.1. Study Design. This study used a three-arm randomized design.

2.2. Sample. We recruited a demographically diverse, stratified random sample of midlife men and women aged 40–60 from an Internet research panel administered by Survey Sampling International (SSI) [67]. SSI is a research firm that maintains a panel of more than two million members who have agreed to receive email solicitations for questionnaires of this type. SSI recruits members using multiple opt-in techniques, including Internet banner ads, online recruitment methods, and random digit dialing. All members of SSI research panels complete a screening questionnaire to elicit detailed demographic information. The survey process for all subjects was completely anonymous, so this study received exemption from the University of Michigan Institutional Review Board (#HUM00039282). At the conclusion of the survey, participants were routed back to SSI for payment.

2.3. Protocol. We conducted a web-based experiment of midlife adults aged 40–60 using SSI. To achieve demographic diversity (but not representativeness) we established target response rates roughly matching the prevalence of gender and racial/ethnic groups in the US population. We dynamically adjusted the email invitations for the sample to achieve the desired distribution of participants by demographic variables. Recruitment consisted of an initial email invitation from SSI, followed by 1–2 reminder emails to nonrespondents.

The advertisements were created by gathering messages from health-related organizations that promote exercise on the Internet, such as the American Heart Association [68]. We modeled the structure of our advertisement after typical testimonial-based marketing (e.g., Medifast) [69]. The advertisements were reviewed for face validity by experts in framing, decision making, and marketing as well as medical doctors.

Once the respondents accessed our online survey, they were informed “*In this study we are interested in physical activity communications. We will show you a media message about physical activity and then ask questions following it. We are interested in knowing how you think and feel.*” Participants then were randomly assigned to read one of three advertisements, and then they answered questions about physical activity, the benefits of physical activity, and demographics.

All of the advertisements were created to be “gain-framed” and highlighted three distinct benefits from being physically active. The advertisements were also identical in the following ways: one page long, contained a photo of a middle-aged white couple, and a description of what

“counts” as being physically active. In addition, the frames (e.g., physical activity improves health) were reinforced by having them at the top of every page of the survey. We decided to use the term “physical activity” instead of “exercise” because of the potential controlled regulations and negative meaning that might be specifically associated with the word “exercise,” in order to prevent that from confounding our experiment.

The advertisements differed by the frame used to promote being physically active (e.g., the benefit derived from or stated goal for being physically active). The first frame featured “better health.” The second frame featured “weight loss.” The third frame featured “daily well-being.” (Appendix I in Supplementary Material available online at doi:10.1155/2012/354721. shows the three advertisements used in this framing experiment.)

2.4. Measures

2.4.1. SDT Regulation Variables

Controlled Regulation. *Controlled regulation* reflects having an external locus of causality. *External Regulation* refers to initiating a behavior to fulfill an external demand or a socially constructed contingency. *Introjected Regulation* reflects an individual “partially internalizing” the value of being active but not in a deeper sense where it is truly accepted as one’s own. Introjection-based behaviors are done to avoid guilt and shame and to attain feelings of worth. Controlled SDT regulations were measured by adapting two items from the Treatment Self-Regulation Questionnaire (TRSQ) related to diabetes [70, 71]. It was measured by taking the mean of External Regulation plus Introjected Regulation. Participants were informed: “*The following statements list reasons people often give when asked why they are or would become physically active. Whether you currently are physically active or not, please read each statement carefully and indicate whether or not each statement is or would be true for you personally if you decided to be physically active.*” Participants responded to two items with a 7-point scale, from 0 (Not at all true) to 6 (Very true). *External regulation* was assessed by the statement: “*I want others to see that I can do it.*” Higher scores indicate higher external regulation. *Introjected Regulation* was assessed by the statement: “*I would feel bad about myself if I didn’t try to be physically active.*” Controlled Regulation ranged from 0 to 6. The Controlled Regulation mean (S.E.) score across gender was 3.4 (0.4) (Alpha = 0.59). Higher scores indicate higher Controlled Regulation. The mean score indicates that, on average, participants felt somewhat controlled toward being physically active.

Autonomous Regulation. *Autonomous regulation* refers to the origin of behavior coming from inside the self. It reflects individuals believing that physical activity is valuable and participating because it feels good or is inherently satisfying. Autonomous SDT regulations were measured by adapting items from the TRSQ related to diabetes [70, 71] and the Behavioral Regulation in Exercise Questionnaire

(BREQ) [72]. Participants were informed: “*The following statements list reasons people often give when asked why they are or would become physically active. Whether you currently are physically active or not, please read each statement carefully and indicate whether or not each statement is or would be true for you personally if you decided to be physically active.*” Participants responded to two items with a 7-point scale, from 0 (Not at all true) to 6 (Very true). Autonomous regulation was measured by taking the mean of Identified Regulation plus Intrinsic Regulation. *Identified Regulation* refers to personally valuing physical activity participation. It was assessed by the statement: “*I truly feel that being physically active is the best thing for me.*” Higher scores indicate higher Identified Regulation. *Intrinsic Regulation* refers to being physically active as a way to achieve positive emotional experiences and/or satisfaction derived from participating in the behavior per se. It was assessed by the statement: “*It feels good to be physically active.*” Higher scores indicate higher Intrinsic Regulation. Autonomous Regulation ranged from 0 to 6. The Autonomous Regulation mean (S.E.) score across gender was 4.3 (0.3) (Alpha = 0.85). Higher scores indicate higher Autonomous Regulation. The mean score indicates that, on average, participants felt somewhat autonomous toward being physically active. The Autonomous Regulation and Controlled Regulation indexes were positively correlated = 0.64 ($P > 0.001$).

2.4.2. Body Image. *Body image* refers to how individuals perceive and feel about their bodies [73]. We chose the Body Image State Scale (BISS) because of its sensitivity to changes in state body image. The BISS has acceptable internal consistency and is sensitive to reactions in positive and negative situational contexts. Sex differences in body image reflect those that have been seen [74]. The BISS is phrased “*For each of the questions below, select the one statement that best describes how you feel right now, at this very moment.*” Participants responded to two items from the BISS that reflected body satisfaction, using a 9-point scale from 0 (extremely dissatisfied) to 8 (extremely satisfied) about (1) *my body size and shape* and (2) *my weight*. Higher scores indicate a more positive body image. The Body Image mean (S.E.) score across gender was 2.4 (0.6) (Alpha = 0.94). The mean scores indicate that, in general, participants reported poor body image.

2.4.3. BMI. BMI was calculated as the ratio of study participants’ self-reported weight (kg) to self-reported height squared (m^2) [75].

2.4.4. Gender. *Gender* was a dichotomous variable. Individuals indicated if they were female or male.

2.5. Analyses. We fit three-way ANOVAs to the continuous outcome variables of interest, checked assumptions of linear models, and found no patterns that required remediation. The predictor variables for these models included the experimental condition (Frame), Gender, and BMI (obese and overweight). The initial model for each dependent

variable included all possible interactions with Frame, Gender, and BMI. We used backward variable selection [76] to discover the most parsimonious models. The Bonferroni correction was used for group comparisons as a conservative method to control for type II errors. SPSS Version 19.0 was used [77]. Data are displayed in graphs with error bars showing the 95th percentile confidence intervals of the mean. Appendix II in Supplementary Material available online at doi:10.1155/2012/354721 shows the adjusted means and standard errors for all variables. We also conducted post hoc analyses on the individual components of controlled and autonomous regulation to understand how the advertisements impacted these individual regulations.

3. Results

A total of 3470 participants accessed the survey, with a 67% completion rate ($n = 2313$). This research question aimed to understand how overweight and obese individuals respond to the typical exercise frames seen in society and health care, with a specific interest in the effects from a “weight loss” frame. Because of that, we only included individuals in the analyses who had BMIs categorizing them as overweight or obese. There were 1690 participants remaining after the underweight and normal weight participants were removed. BMI categories in this study were distributed as follows: 44.9% were “overweight” ($\text{BMI} \geq 25\text{--}29.9 \text{ kg/m}^2$) and 55.1% were “obese” ($\text{BMI} \geq 30 \text{ kg/m}^2$). Mean (S.E.) BMI of this sample was 32.6 (0.17). Forty percent of female participants were overweight and 60% were obese. Forty-nine percent of men were overweight and 51% were obese. Table 1 shows the study participants’ demographics.

3.1. Main Dependent Variables

3.1.1. Controlled Regulation. Our final model for Controlled Regulation toward being physically active indicates one significant two-way interaction between Frame and BMI, $F(2, 1667) = 3.4, P < 0.05, \eta_p^2 = 0.004$. See Figure 1 for the mean scores of Controlled Regulation. The framing effects on Controlled Regulation depend on BMI. For those individuals who were overweight, reading the daily well-being advertisement decreased Controlled Regulation compared to reading the weight loss and health advertisement. In contrast, for obese individuals, those reading the daily well-being advertisement reported higher Controlled Regulation, compared to those reading the health and weight loss advertisement.

Post Hoc Analyses. We conducted post hoc analyses separately on the two components of Controlled Regulation, External Regulation and Introjected Regulation toward being physically active.

External Regulation. The experiment had no framing effects on External Regulation.

Introjected Regulation. The Introjected Regulation model showed a significant two-way interaction between Frame and

TABLE 1: Baseline demographics of obese and overweight participants ($N = 1690$).

Age (mean, S.E.)	52.5 (1.2)
Sex (%)	
Female	48.6
Male	51.2
Missing	0.2
BMI category (%)	
Overweight	44.9
Obese	55.1
Education (%)	
Some high school/high school graduate	26.5
Some college	33.1
College degree	24.6
Some postgrad	4.7
Master’s degree	7.4
Grad/Prof degree	1.7
Missing	2.0
Marital status (%)	
Married	55.1
Domestic partner	6.3
Separated/divorced/widowed	18.7
Single/never married	17.9
Missing	2.0
Household income (%)	
< \$20,000	17.8
\$20,000–\$59,999	45.9
\$60,000–\$99,999	22.0
\$100,000–\$149,999	7.6
\$150,000+	2.4
Missing	4.3
Employment status (%)	
Full time	41.5
Part time	12.9
Not employed	43.6
Missing	2.0
Ethnicity (%)	
African American	15.1
Asian	2.8
European American	68.6
Hispanic	11.1
Other	0.4
Missing	2.0

BMI, $F(2, 1675) = 6.2, P < 0.01, \eta_p^2 = 0.007$, in the same direction as seen in Controlled Regulation. See Figure 2 for the mean scores of Introjected Regulation.

3.1.2. Autonomous Regulation. Our model for Autonomous Regulation toward being physically active indicates one significant three-way interaction between Frame, Gender,

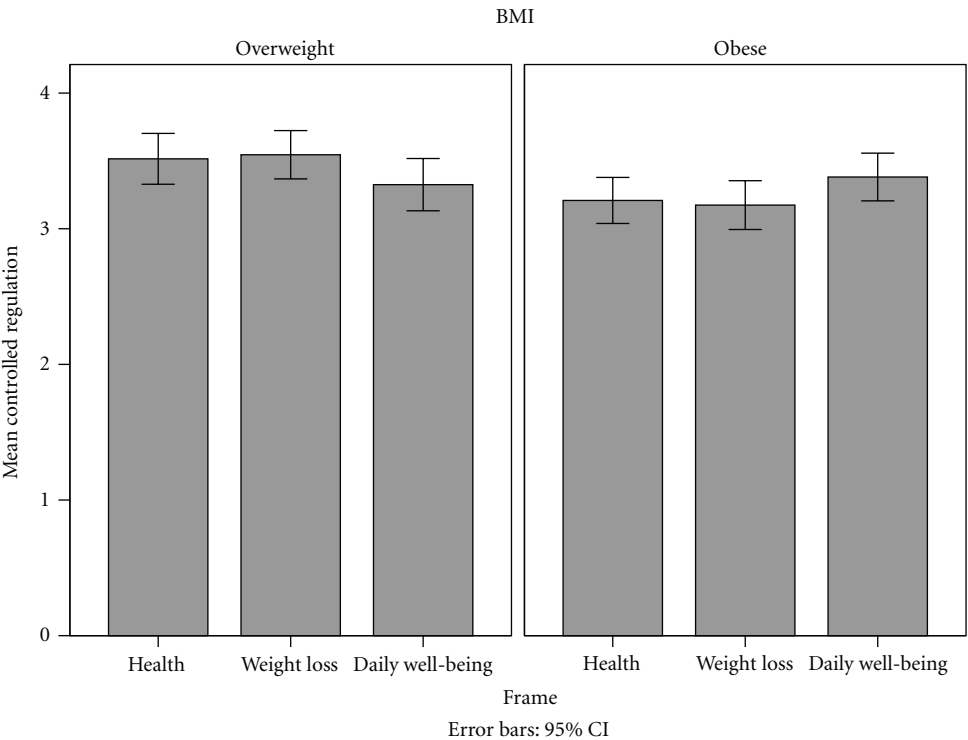


FIGURE 1: Controlled regulation.

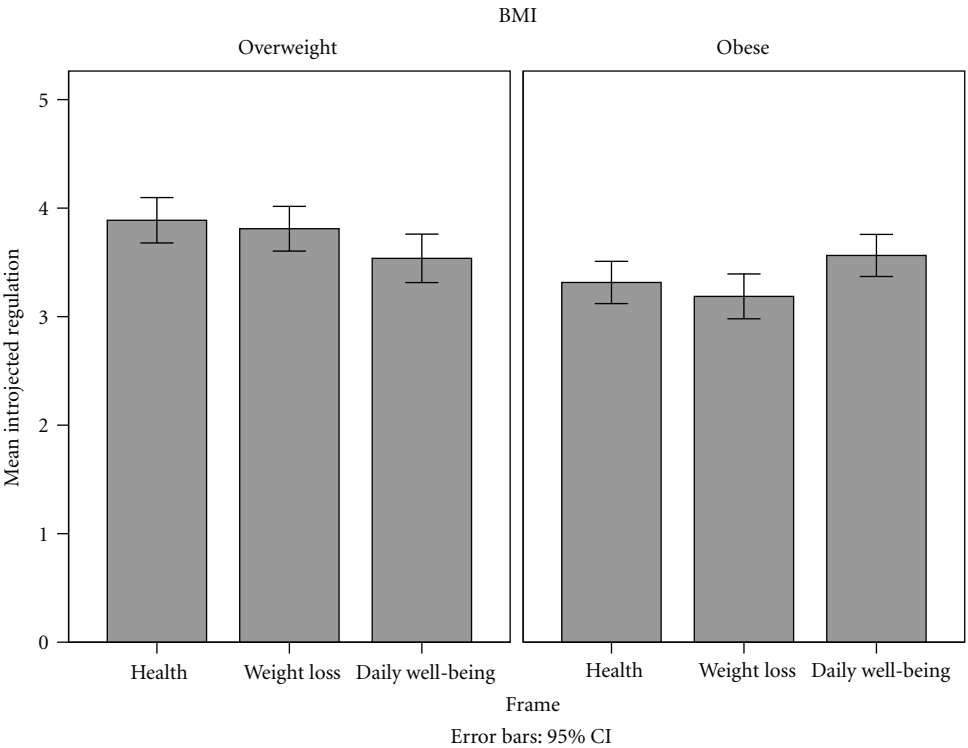


FIGURE 2: Introjected regulation.

and BMI, $F(2, 1665) = 4.5$, $P < 0.05$, $\eta_p^2 = 0.005$. See Figure 3 for the mean scores of Autonomous Regulation. The framing effects on Autonomous Regulation differed depending on BMI and Gender. Among overweight individuals, men and women responded differently to the daily well-being frame. Overweight women who read the daily well-being advertisement reported greater Autonomous Regulation than those reading the weight loss, but not health, advertisement. In contrast, overweight men who read the daily well-being advertisement reported lower Autonomous Regulation compared to those who read the weight loss and health advertisements.

Post Hoc Analyses. We conducted post hoc analyses separately on the two components of the Autonomous Regulation variable, Identified Regulation and Intrinsic Regulation.

Identified Regulation. Our final model for Identified Regulation toward being physically active indicates a significant Frame-Gender interaction, $F(2, 1666) = 3.1$, $P < 0.05$, $\eta_p^2 = 0.004$, and a significant Frame-BMI interaction, $F(2, 1666) = 3.1$, $P < 0.05$, $\eta_p^2 = 0.004$. See Figure 4 for mean scores of Identified Regulation. Overweight women reading the daily well-being advertisement reported marginally higher Identified Regulation than those reading the weight loss advertisement. In contrast, overweight men reading the daily well-being advertisement reported lower Identified Regulation compared to those reading the weight loss advertisement.

Intrinsic Regulation. Our final model for Intrinsic Regulation toward being physically active indicated a significant three-way interaction between Frame, Gender, and BMI, $F(2, 1665) = 6.7$, $P < 0.01$, $\eta_p^2 = 0.008$. See Figure 5 for mean scores of Intrinsic Regulation. Among overweight individuals, women and men had very different responses. Overweight women reading the daily well-being advertisement reported higher Intrinsic Regulation toward being physically active than those reading the weight loss advertisement. Overweight men, however, had the opposite response. Those who read the daily well-being advertisement reported lower Intrinsic Regulation than those reading the weight loss and health advertisements.

3.2. Body Image. Our final model for Body Image showed a trend toward a three-way interaction between Frame, Gender, and BMI, $F(2, 1236) = 2.8$, $P < 0.10$, $\eta_p^2 = 0.005$. See Figure 6 for mean scores of Body Image. Overweight women who read the daily well-being advertisement reported more favorable Body Image compared to those reading the weight loss advertisement. As hypothesized, this framing effect was not seen among men.

4. Discussion

This study showed that there are immediate framing effects on behavioral regulation and body image from simply reading a one-page advertisement about physical activity and that gender and BMI moderate these effects. The moderation

of the framing effects makes interpreting and applying these findings complicated. Overweight women tended to respond positively to the daily well-being frame. This was seen most convincingly in body image and autonomous regulation, with the strongest effect in the intrinsic regulation component of autonomy. Overweight men tended to respond unfavorably toward the daily well-being frame, with generally equal effects on both the identified and intrinsic components of autonomy. None of our hypotheses related to the health frame were supported. This study expands the framing literature by being the first to evaluate *which* gain-frame messages most optimally influence SDT constructs and body image among overweight and obese men and women in midlife.

4.1. Daily Well-Being Frame Compared to Weight Loss Frame

4.1.1. Framing Effects among Midlife Women. Our hypothesis that “daily well-being” would predict greater autonomy toward being physically active compared to “health” or “weight loss” was only partially supported. A trend among overweight (but not obese) women suggested that reading the daily well-being frame predicted higher autonomous regulation toward being physically active compared to reading the weight loss frame. Autonomy refers to feeling as the “causal agent” of one’s life and acting in harmony with one’s fully integrated self [33]. These data suggest that just the idea of *striving toward well-being through physical activity* may foster autonomous feelings, something that may help women better internalize the value of being physically active and promote ongoing participation. This idea is supported by previous behavioral research showing that overweight women exercising in order to enhance their well-being feel more autonomous and participate in more exercise over time than women exercising to lose weight [24, 41]. Moreover, two other studies investigated differences between active and inactive women related to their reasons for participating. They found that women who are regularly physically active report exercising in order to increase their well-being and quality of life. In contrast, those who are not active report weight loss as their main motive for participating [62, 78]. While it cannot be known whether individuals with weight loss motives aim to “improve appearance” or “benefit health” without also investigating this question specifically [79], the interconnections between losing weight, health, and socialized pressures to be thin and attractive are powerful, often implicit, and might be hard for individuals to untangle [66, 80, 81].

Interestingly, the post hoc analyses showed that the experiment affected “intrinsic” regulation toward being physically active (feeling good from or enjoying the process of being active) more than “identified” regulation (cognitively valuing physical activity). This experiment showed that framing physical activity as a way to achieve daily well-being (compared to weight loss) positively influenced overweight women’s perceptions about *the experience of being physically active*. Well-being and feeling good are inherently self-determined. Thus, frames featuring enhanced well-being may implicitly give women permission to create physical

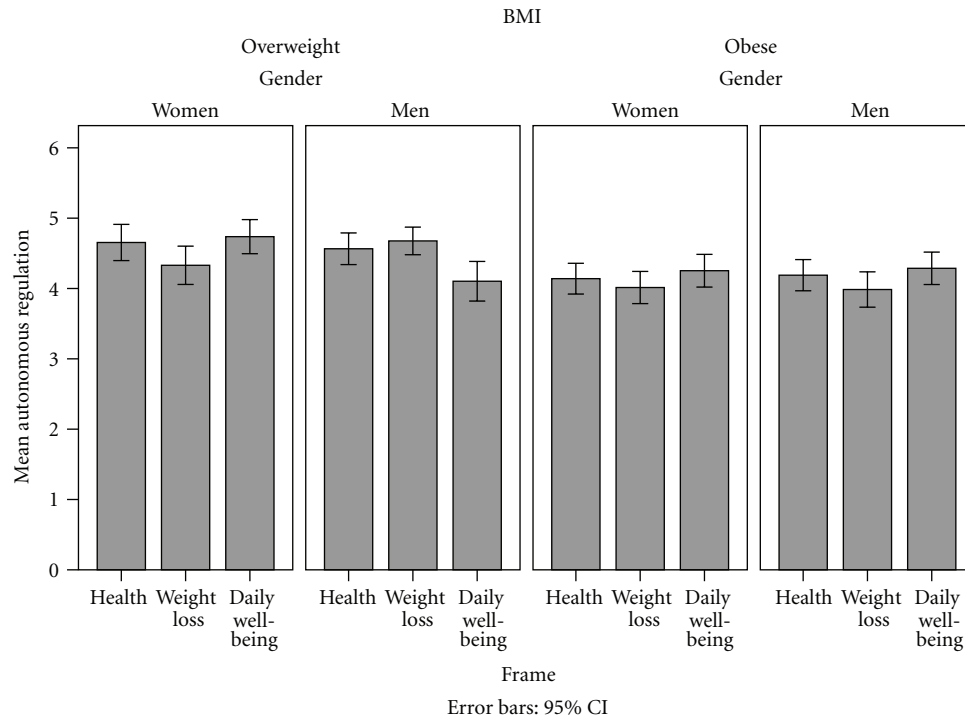


FIGURE 3: Autonomous regulation.

activity experiences that are congruent with their unique preferences and *intrinsically feel good to them* [82]. If so, this would help women experience physical activity as an *autonomous* activity.

Intrinsic experiences with physical activity, however, may not just influence participation and adherence [83–85]. They also seem to influence weight loss maintenance. Intervention research showed that *increased intrinsic motivation for exercise was the strongest predictor* of long-term weight loss among women who participated in a weight reduction program [86]. Furthermore, physical activity messages that emphasize well-being *experiences* instead of women's *bodies* may positively impact women's body image. Women's socialization to physical activity and exercise embeds sociocultural appearance and weight-related pressures [37, 47, 81]. Thus, reframing physical activity as a "positive experience producing" behavior instead of a "body shaping" behavior might improve women's body image. In partial support of this hypothesis, overweight (but not obese) women who read the daily well-being advertisement reported better body image compared to those who read the weight-loss advertisement. Another study, on college-aged women, conducted a framing experiment with similar goals as ours. They found that participants showed an immediate and positive framing effect on body image from reading magazine articles featuring "feel good" messages compared to articles featuring "look good" messages [16]. Having intrinsic goals for exercise has also been shown to enhance self-worth [29]. *This research advances the literature by showing that there are immediate and beneficial framing effects on body image from simply*

reading an advertisement featuring daily well-being as the primary reason to become physically active, among overweight women in midlife.

Fostering positive body image may promote sustainable weight control. New research emphasizes the importance of a positive body image for maintaining health behaviors. A 12-month weight management intervention that included a body-image educational component resulted in improvements in body image among participants [87]. The authors further reported that having a more positive body image improved eating self-regulation and behavior. This finding with eating behavior is similar to two separate physical activity interventions that also had program curriculum that addressed the thin ideals and weight-related pressures that women experience. These interventions, conducted with convenience samples, explicitly reframed exercise *away from* weight loss and body shaping goals to self-care and self-worth as key benefits of and new reasons to become more physically active. Both interventions showed increased physical activity from baseline to after the program that was sustained at the long-term study follow-ups [88, 89]. *Having positive feelings about the self, such as from positive body image and self-worth, may be very important to produce sustainable self-regulation and behavior. Thus, our physical activity frames and messages/promotion might improve outcomes if they were crafted to help women feel good instead of bad about themselves and their bodies* [90].

4.1.2. Framing Effects among Midlife Men. Contrary to our hypothesis and the findings among overweight women,

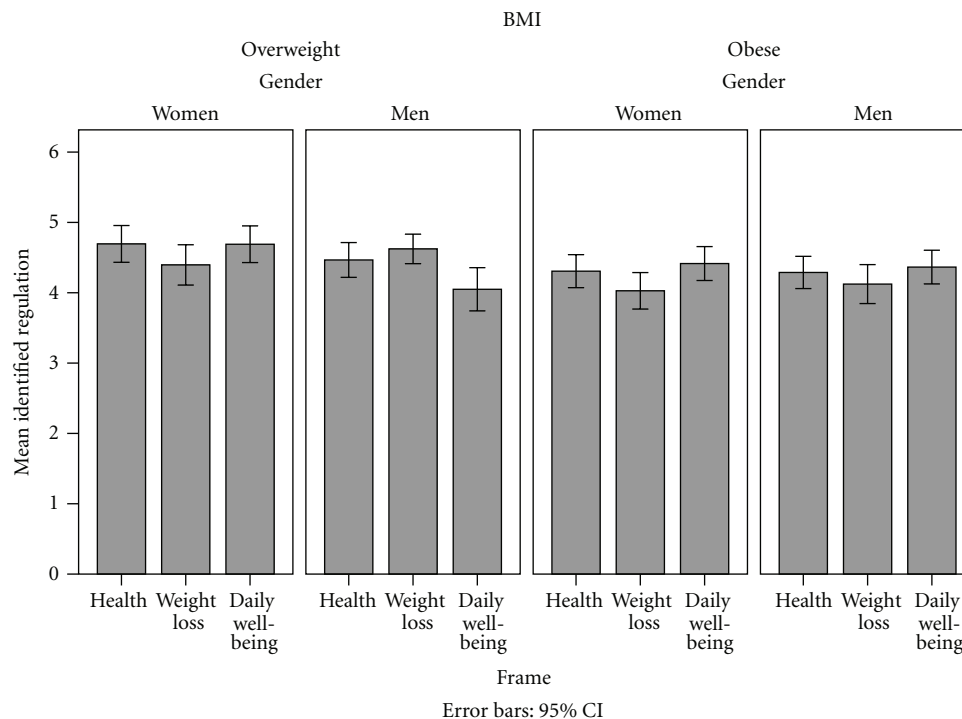


FIGURE 4: Identified regulation.

overweight men who read the daily well-being advertisement reported *less* autonomy toward physical activity compared to those who read the weight loss advertisement. This finding is curious. Based on SDT and behavioral economics research, we thought that the daily well-being frame would be experienced as the most autonomous by *both women and men*. Despite this, overweight men in our sample experienced the weight loss frame as more autonomous than the well-being frame.

These data might reflect a true gender difference and may indicate that well-being is not relevant or is a nonoptimal physical activity frame for men. The notion that proximal and noticeable well-being benefits from physical activity are not compelling to men, however, conflicts with research across genders suggesting that immediately experienced benefits are more motivating than abstract and distant benefits [91]. In fact, to improve behavioral pursuit, behavioral economists recommend “reward substitution,” a strategy to reframe a behavior away from distant benefits (e.g., disease prevention) to rewards that can be experienced immediately (e.g., increased energy) [60, 61].

An alternative explanation for this unexpected finding, based on research focused on men’s unique experience with health behavior, may help explain why the daily well-being frame did not foster autonomy among men. The daily well-being advertisement text mentioned benefits like “improved mood” and “stress reduction.” It might be that this language was perceived as promoting “mental health” (See the advertisement text in Appendix I in Supplementary Material). Men may be less comfortable with mental health issues [92] and thus may not feel self-determined when confronted with

messages about them. In addition, many men define stress as something that is driven by factors that are outside of their control, such as job strain and family responsibilities [93]. Thus, men reading the daily well-being advertisement might have been primed to think about these larger and overwhelming stressors and, as a result, felt less autonomous toward being physically active compared to those reading the weight loss or health advertisements. Moreover, other research compared women’s and men’s goal hierarchies for losing weight. This study found that while “feeling good” was the central goal (e.g., motive for change) in women’s goal hierarchy, *it was not central for men* [94]. This study suggests that men may not value well-being experiences as much as women do [95, 96]. However, more in-depth and gender-specific framing research is needed on men in midlife to better understand which frames and messages are most acceptable and motivating to them [97–99].

4.2. Daily Well-Being Frame Compared to Health Frame

4.2.1. Framing Effects among Midlife Women. Contrary to our hypothesis, women reading the daily well-being and health advertisements reported the same level of autonomy toward being physically active. Given that our past research showed that health goals for exercise resulted in non-optimal behavioral regulation among overweight women in midlife [41], this unexpected finding is important to explore.

We conjecture that this current study finding highlights the conundrum related to promoting physical activity for health (to women). It cannot be denied that health is a central value for individuals [100]. Individuals have clearly

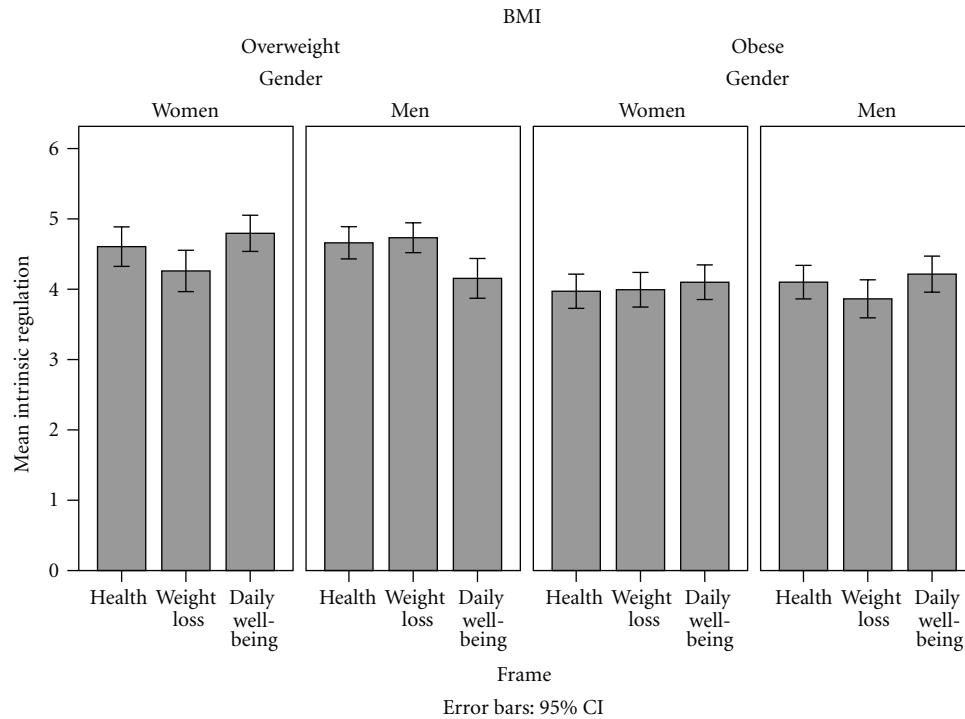


FIGURE 5: Intrinsic regulation.

been socialized to *value* behaviors like exercise because they improve health and prevent disease [101, 102]. Moreover, other exercise studies show that exercising to pursue good health reflects an intrinsic drive and goal [26, 50]. Valuing exercise for its health benefits is also logical given the frequently communicated link between exercise and health by health organizations and the media [15, 53]. In fact, campaigns even brand exercise explicitly as “medicine” [58]. Placing a high value on health is generally thought to motivate individuals to practice health behaviors [103]. Yet, while the societal branding of exercise for health benefits has been successfully internalized by most, we remain skeptical that health as the primary reason for exercising will optimally promote sustainable participation among women [19].

What an individual espouses as important does not necessarily translate into behavior that is sustained over time. It is easy for individuals to report “exercising for health” as an important value and autonomous aim because, in theory, it is. What individuals find important enough to consistently prioritize within their busy lives, however, may be different than abstract values. For example, in previous mixed-method longitudinal research, midlife women who were overweight evaluated how much they valued their superordinate-level goal for exercising, compared to their other important life goals [19]. The participants in the three largest categories, “current health,” “healthy aging,” and “quality of life,” reported *equally* valuing their goals. Yet, those with “current health” or “healthy aging” exercised significantly *less* than those having exercise goals related to enhancing their quality of life. Research on values and behavior shows that situational forces (e.g., barriers to the

behavior) can dramatically reduce behaviors that affirm cherished values [104]. *It is easy to see how exercising in order to benefit health would be highly valued by women. Yet, because women constantly juggle multiple roles and responsibilities [95, 105], it is also easy to see how exercise aiming to improve health could be trumped by the other daily priorities against which it constantly competes [19, 31, 106]. Doing behaviors to benefit health, while considered important, may not rank as a top or urgent priority on women’s daily “to do” lists.*

Taking medication offers another example to support the notion that despite being valued, health may not be the optimal frame to promote sustainable behavior. The purpose of taking medication is to improve health and prevent disease, not unlike physical activity. Taking pills, however, while not a simple behavior, does not include the same level of logistics and negotiating time that remaining physically active does. Despite this, there are well-documented low adherence rates to prescription medication around the world [107, 108].

4.2.2. Framing Effects among Midlife Men. Overweight men who read the daily well-being advertisement reported *less* autonomy toward physical activity compared to those who read the health advertisements, contrary to our hypotheses and different than the null effects seen among women.

This current study comes out of our program of research that, until now, has been focused on the gender-specific issues faced by midlife, overweight women and is our first time studying these questions among men. We had assumed that daily well-being frames would positively impact men’s

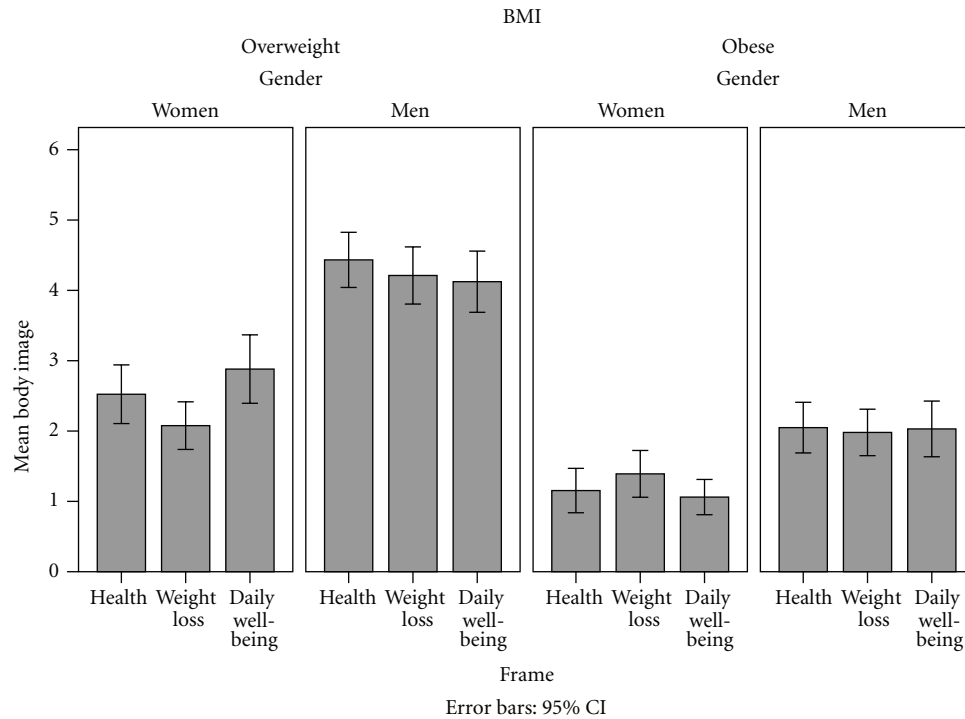


FIGURE 6: Body image.

behavioral regulations, based on previous investigations on women, SDT, and behavioral economics studies [24, 33, 62, 91, 109]. However, these study data suggest that well-being might not be an optimal exercise frame for men, contrary to our hypothesis. These data suggest that men may feel more autonomous toward a health frame compared to a well-being frame for being physically active.

We believe that to learn how to optimally promote physical activity, it is essential to develop marketing messages that target gender and other specific demographic characteristics, as industry does [19, 110]. For example, a popular commercial weight loss program website (Medifast) shows that they market differently to men than to women. The page promoting Medifast to men started with the following text “When you want to lose weight and get healthy, Medifast makes sense...” [111]. In contrast, the page targeting women says “If you’re unhappy or unhealthy because of your weight, Medifast can help you get fast results...” [112]. It is interesting to note that some marketing strategies in industry support the general gender differences identified in this study and our research on women and physical activity [62, 96, 113], such that “losing weight” and “health” are often featured motivators *for men*, while well-being outcomes such as “joy,” “hope,” “pep,” [114] and overcoming “unhappiness” [112] are frequently emphasized for women. However, without more inductive research with men on physical activity per se, it is premature to make conclusions about which frames will be most motivating.

It is important to contextualize this study within a parallel program of research on exercise goals in Europe. There is a growing specialized area within SDT research

that investigates the differential contribution of goals and behavioral regulations to physical activity participation that is referred to as the “what” and “why” of goal pursuits. In this specific framework, the “what” of goal pursuits includes participation motives or goal contents (the reason why an individual decides to participate) while behavioral regulations are referred to as the “why” of goal pursuits. In support of the current finding that men experience “health” as a more autonomous goal and frame, much of this other research also finds a positive relationship between “health” goals for exercise, autonomous regulation [26, 29, 115], and physical activity participation [26, 30]. While this European-based research is in line with these unanticipated findings among overweight men, they do not support our previous research showing that women experience health goals for exercising as controlling and predictive of decreased exercise participation over time [24, 41].

We should also consider whether distinct findings among different programs of research might be due to differences in study populations (gender-specific versus mixed gender investigations and analyses, ethnicity, etc.), methodological issues (variable-centered versus person-centered measurement), and life stage (targeting specific life stages versus including individuals in samples across the adult lifespan, etc.). In addition, “health” might have distinct meanings within different cultures that may influence findings in the realms of physical activity motivation, behavior, and weight control. While some research suggests that health goals and frames for exercising benefit motivation [29] and participation [30], research perspectives outside of the physical activity literature suggest that promoting the value

of health as the primary reason for exercise might present challenges to individuals sustaining participation over time [91, 104, 109].

4.3. Controlled Regulation. Controlled regulation was much less influenced by this experiment than autonomous regulation. This was unexpected. Given our previous research, and the extreme cultural pressures to be thin, we were surprised that the weight loss frame was not more greatly associated with controlled regulation, especially among women.

Both the lack of hypothesized effects related to controlled regulation, and the low internal consistency reliability coefficient seen with the Controlled Regulation Index were reported elsewhere [115]. This high mean controlled regulation score suggests that individuals may have been socialized in ways, through the media and within health care, that generally promote controlled regulations toward being physically active. Thus, reading a one-page advertisement may not be sufficient to change this pressuring regulation toward being physically active.

It is interesting, however, to note that the controlled regulation and autonomous regulation indexes were strongly positively correlated. As others have reported, individuals can feel both controlled and autonomous toward being physically active at the same time [116]. This is not surprising given that our general socialization to being physically active includes a strong external focus on body and weight [14] and that individuals do value being healthy and well [103]. Despite this, having concurrent autonomous and controlled regulations toward physical activity may promote ambivalence. Ambivalence toward physical activity is not optimal for sustainable participation. When individuals feel ambivalent toward physical activity they are less likely to prioritize it among the other goals and responsibilities against which it constantly competes [117].

4.4. Different Framing Effects among Overweight and Obese Individuals. The framing experiment, in general, had fewer effects among the obese participants. While not hypothesized, most effects occurred among the overweight participants. The only effect seen among the obese individuals occurred in controlled regulation (specifically in introjected regulation) compared to overweight participants. The overweight individuals reading the daily well-being advertisement compared to those who read the weight loss or health advertisements reported decreased controlled regulation. This suggests that, across genders, overweight individuals may experience a daily well-being frame for physical activity as less controlling than health- or weight-related frames.

The opposite pattern was seen among obese individuals. Obese men and women who read the daily well-being advertisement reported higher controlled regulation compared to those who read the weight loss or health advertisement. Obese individuals experience extreme pressure in society, especially in areas related to their health and weight. We wonder whether their higher controlled response (compared to the overweight participants) to the daily well-being advertisement reflects that the obese participants felt pressured to

add one more thing to strive toward on a list that probably already includes losing weight and improving health.

To understand the lack of effects among obese individuals it is important to consider that they experience extreme pressures and prejudices related to their larger size. Obesity is considered one of the most enduring stigmas in society because of the common perception that extra weight is due to controllable personality flaws like laziness, gluttony, or lack of self-discipline. Weight discrimination leads to unfair treatment in employment and health care, among other areas. In addition, the consequences of being overweight and obese worsen as individuals reach heavier weights [118, 119]. Moreover, the health care context uniquely challenges individuals who are obese. There is a heightened focus on and clear disdain of being “obese.” Even professionals whose careers emphasize research or the clinical management of obesity show a very strong weight bias. Schwartz and colleagues found that health professionals ($N = 389$) endorsed both implicit and explicit stereotypes that overweight and obese people are lazy, stupid, and worthless [120]. Thus, it is not surprising that obese participants reported lower body image compared to those who were overweight in this study.

Despite frequent dieting, obese individuals frequently do *not* include physical activity as a weight loss strategy. One qualitative study among obese individuals reported that they have many barriers to being physically active, including being embarrassed to exercise in front of people and experiencing exercise as difficult because of their weight and physical health [121]. Another study examined self-reported physical activity barriers and the effects of these barriers on physical activity behavior among 280 previously inactive women enrolled in a physical activity intervention. The authors reported that the obese participants reported significantly greater physical activity barriers compared with those who were overweight ($P < 0.05$) [122]. Obesity is also frequently accompanied by depression [123], and depressed individuals might be even less likely to respond to reading a one-page advertisement about physical activity.

It cannot be overstated that obese individuals face daunting barriers to being physically active. We believe that the lack of effects among the obese participants in this experiment suggest that reading a one-page advertisement is simply not a strong enough intervention for obese individuals, given their negative experiences with and their extreme barriers to exercising. Thus, it may take a much more intense intervention, one with ongoing support, to foster autonomy among obese individuals, as occurred in an intervention study previously conducted with obese women [124]. Much more research is needed to identify how to help obese individuals address their unique barriers so that they can become more physically active in ways they can sustain.

4.5. Why Well-Being for Women? Increasing participation among women in sustainable ways might be a question of improving how we “sell” physical activity and exercise through intensive market research and principles such as branding [19, 110, 125–127]. Instead of promoting the end

points that clinicians, business, and governments endeavor to achieve from promoting exercise to individuals (e.g., “improved health” in service of health care savings), health communications might become more meaningful and persuasive to women if they were based on the exercise benefits that are most compelling to them [41, 62, 94, 96].

Well-being and what “feels good” is inherently subjective. Individuals who strive toward achieving well-being goals have to turn inward in order to determine how to achieve well-being experiences *for themselves* [29]. *Thus, striving toward well-being is inherently autonomous and, as such, may foster a key aspect of the basic psychological needs that promote flourishing and optimal motivation, as posited by SDT* [33]. In fact, other research found that intrinsic (relative to extrinsic) exercise goals positively predicted psychological needs satisfaction [29]. Thus, to promote physical activity as a key means to daily well-being capitalizes on its potentially inherent autonomous nature and, because of that, may be ideal to facilitate ongoing physical activity motivation and participation among overweight women.

There is significant research showing the connection between physical activity and well-being [8, 85, 128–130]. But women may not make that connection when deciding whether or not to be physically active because the vast majority of physical activity promotions feature health- and weight-related benefits [14, 68]. In support of this contention, our previous research showed that only a minority of women reported being physically active to enhance well-being (12%) or quality of life (22%) [19, 41]. *This is concerning because it suggests that women in midlife have not been socialized to consider physical activity for experiential positive mood enhancing and well-being purposes* [41]. This could be reducing the effectiveness of our social marketing and promotion of physical activity to overweight women. Reframing physical activity as a primary way women can feel better every day (like the American Heart Association has started doing: “You’ll feel better and your life depends on it” [131]) and the downstream effects from feeling better on meaningful areas of life (more patient parenting, enjoyment and productivity at work, etc.) may better promote sustainable physical activity and, hence, may result in better weight control among overweight women.

4.6. Limitations. There are significant limitations to this study. The effects from this experiment are very small, but that was to be expected from this weak intervention. The purpose of this experiment was a “proof of concept” study to see whether this line of research, investigating whether distinct “gain-frame” messages can immediately impact individuals’ regulations and body image, was worth pursuing. We believe the findings suggest this line of questioning merits further research, with an emphasized need for more inductive work to illuminate what physical activity frames will be most motivating and compelling to overweight men as well as obese individuals in general. While we proposed that there might be long-term behavioral implications from promoting physical activity with these different frames, these experimental data do not address nor support a causal

connection. Another limitation is our sample. Participants who sign up with companies to regularly take surveys for payment represent a specific population that are likely very different from the general population and may affect how they responded to the questions. For example, our study participants reported extremely high levels of unemployment. While this may impact the generalizability of the findings, the randomized design supports the internal validity of this study. Finally, while this sample was selected by the survey research firm to approximate the US population, it still contained a vast majority of European Americans and thus potentially different framing effects by ethnicity are not known.

4.7. Strengths. This study has many strengths. We used a randomized design to evaluate the immediate framing effects on physical activity behavioral regulations and body image among a large sample of midlife adults who were overweight and obese. Having research that focuses on a specific life stage and population is an important strength because individuals in different life stages have different responsibilities, priorities, and values [43, 44]. Thus, to understand how to optimally promote physical activity to a particular group at risk, it is important to investigate that specific population based on their demographics. In addition, while we kept our focus on investigating adults in midlife, we expanded our targeted program of research on overweight women to include men in order to better understand how gender influences motivational responses to distinct frames for promoting physical activity. *This study advanced the framing literature by investigating and identifying differences in effects by gender, and between participants who are overweight and obese, with a less frequently studied frame (daily well-being) using variables related to SDT and body image. These and other data suggest that how we market and frame physical activity may need to change depending on the demographics: life stage, gender, and BMI status, among other variables* [94, 132].

5. Conclusions

How physical activity benefits are framed in health communications matters. The framing of benefits brands physical activity and influences the specific goals individuals strive to achieve through becoming physically active [41, 43]. *Because not all goals are equally motivating* [30, 60, 133, 134], *the framing of physical activity has important implications for promoting sustainable physical activity and weight control* [27]. This study showed that there are immediate framing effects on behavioral regulation and body image from simply reading a one-page advertisement about physical activity and that gender and BMI moderate these effects. Overweight women tended to respond positively to the daily well-being frame, especially the intrinsic regulation component of autonomy, while overweight men tended to respond unfavorably toward the daily well-being frame. Research shows that women want their leisure time experiences to reflect freedom of choice and intrinsic experiences [96]. Thus, framing physical activity in ways that are congruent with and reflect women’s valued *experiences* might help them internalize the value

of being active, making it more compelling to fit regular physical activity into their busy days [19, 24, 106]. These findings support a growing body of research that suggests that framing physical activity for daily well-being, compared to framing it for weight loss, might enhance autonomy toward physical activity, making it a better gain-frame message for overweight women in midlife [19, 24, 62]. More gender-specific research is needed about how to optimally frame physical activity for overweight men and for obese individuals more generally.

Conflict of Interests

M. L. Segar would like to disclose that she consults with organizations and speaks internationally to behavioral professionals and individuals about creating sustainable exercise motivation and participation (<http://michellesegar.com/>).

Authors' Contribution

M. L. Segar and C. R. Richardson conceived the study. M. L. Segar, J. A. Updegraff, B. J. Zikmund-Fisher, and C. R. Richardson participated in the study design. M. L. Segar, J. A. Updegraff, and C. R. Richardson participated in the statistical analysis. All authors helped draft, read, and approved the final paper.

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