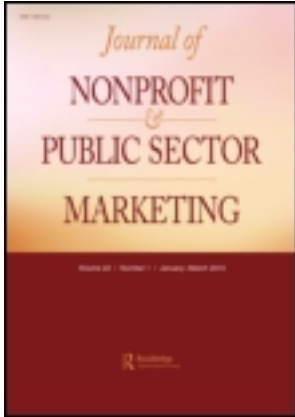


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# **The Fight Against Obesity: Influences of Self-Efficacy on Exercise Regularity**

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*Given the current social problem of obesity, past and current research efforts have examined consumer choice and decision-making regarding food consumption. However, preventative health behaviors such as exercise are also instrumental in combating the obesity epidemic. Limited studies in the marketing literature have explored how internal and psychological characteristics influence physical activity and exercise regularity. Thus, this study seeks to examine how individual self-efficacy impacts exercise behavior. Findings indicate that in order to fully explain the relationship between perceived self-efficacy and exercise regularity, significant mediating factors such as health consciousness, goal progress, attitude toward exercise, and satisfaction with current weight must be included in the decision-making process. Implications for consumers, social marketers, and public policy makers are discussed.*

**KEYWORDS** *self-efficacy, exercise, obesity, social marketing*

## INTRODUCTION

The prevalence of physical inactivity and improper nutrition among Americans has been a public concern for more than a decade. According

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to The Obesity Society (2010), a minimum of 72 million Americans fall into the obese category. More alarmingly, it is estimated that 41% of U.S. adults will be obese by 2015 (Wang & Beydoun, 2007). This concern warrants much needed attention as the number of those considered clinically obese continues to rise (Ferraro, Thorpe, & Wilkinson, 2003; Ogden et al., 2006). Further, not only does the rise in obesity impact the United States, but also other countries around the world such as Mexico, England, Greece, and Australia rank the highest among countries afflicted with escalating obesity rates (NationMaster, 2011). Such a social and health epidemic has even prompted health experts to coin the term *globesity* due to more recent rising global obesity statistics.

Of the negative health-related consequences associated with obesity, diseases such as stroke, cancer, and diabetes are among the most prevalent ailments reported by the Centers for Disease Control and Prevention (2010). Factors attributing to the obesity epidemic include, but are not limited to, an increase in away-from-home consumption, the proliferation of the fast food culture, and creative food marketing initiatives (Seider & Petty, 2004; Grier, Mensinger, Huang, Kumanyika, & Stettler, 2006; Basil, Basil, & Deshpande, 2009). Further, a chief potential cause of the obesity escalation in the United States is that 60% of Americans engage in less than 10 minutes of daily physical activity (Lethbridge-Cejku, Rose, & Vickerie, 2006). As recommended by the U.S. Department of Health and Human Services (2005), individuals should spend at least 30 minutes most days of the week engaging in some form of moderately intense physical activity. Thus, the amount of time Americans spend involved in physical activity is considerably less than what is recommended for healthy living.

Health preventive orientations are a crucial part of reducing the harmful effects of obesity. An individual's perceived ability in implementing actions to accomplish health-related goals plays a considerable role in attaining and maintaining a healthy lifestyle. Such an orientation in achieving healthy outcomes is linked to perceived self-efficacy. Perceived self-efficacy is the belief that one has the capabilities to classify and execute the actions necessary for producing an expected outcome (Bandura, 1997). Perceived self-efficacy can positively impact behavioral change and influence the amount of effort expended in pursuing a goal. Specifically, Oka, Stotts, Dae, Haskell, and Gortner (1993) found that self-efficacy served as the strongest predictor of physical activity levels, while other studies have demonstrated that exercise can have a positive impact on functional performance and quality of life (Piepoli et al., 2004; Smart et al., 2005).

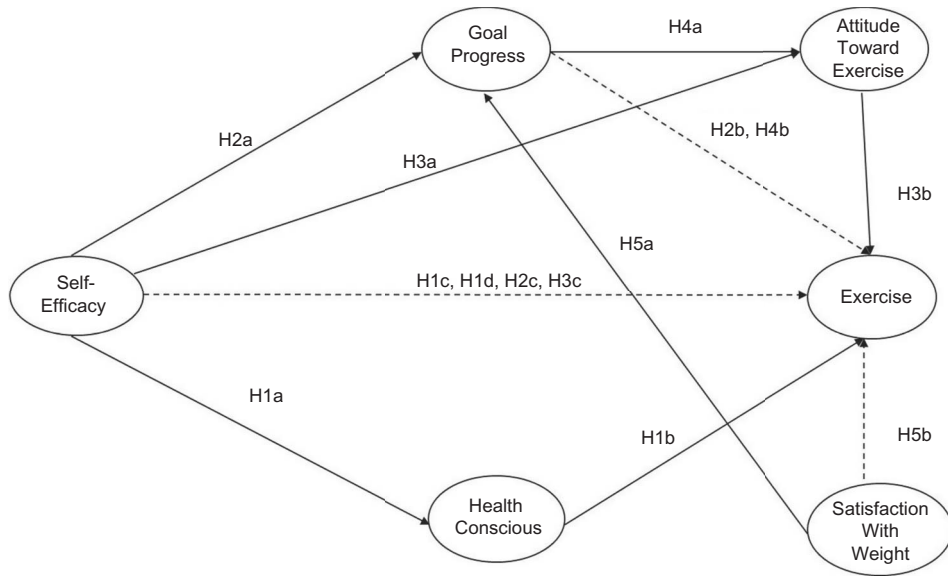
A number of initiatives have been taken by marketers and researchers to help better understand and alleviate the growing obesity problem (Briley & Aaker, 2006; Andrews, Netemeyer, & Burton, 2009; Kemp, Bui, & Grier, 2011). For example, health campaigns have been launched to help create a change in America's poor eating habits (Goldberg & Gunasti, 2007) and strategic packaging of food items by marketers to encourage

smaller portion sizes continue to emerge in food aisles. Further, numerous studies have examined the effects of the provision of nutrition information and health claims on consumer behavior and whether the processing of this information can influence consumer evaluation of products and consumption decisions (Keller et al., 1997; Kemp, Burton, Creyer, & Suter, 2007; Chandon & Wansink 2007; Bui, Burton, Howlett, & Kozup, 2008; Howlett, Burton, & Kozup, 2008; Naylor, Droms, & Haws, 2009). These initiatives have focused primarily on food-related consumption decisions. However, this research contributes to the health and marketing literature by exploring how health preventive behaviors such as exercise can reduce and combat the destructive effects of obesity. To gain a more comprehensive understanding of self-efficacy and health-related behavior discourses among those seeking to lose weight, as well as developing a conceptualized model that best captures the stories of those struggling with self-efficacy and exercise regularity issues, existential phenomenological technique was used to allow for in-depth understanding of the decision-making processes.

We propose a framework for understanding how consumers' perceived self-efficacy and internal mediating factors such as health consciousness, goal progress toward one's ideal weight, attitude toward exercise, as well as satisfaction with one's current weight influence exercise regularity. As an exploratory approach to better understanding health-related behaviors, in-depth interviews were conducted with seven individuals (from an initial pool of 14 prescreened informants) with a body mass index of  $\leq 25$  who were interested in losing weight (see Table 1). Insight garnered from both the interviews as well as previous health research provided the basis for the development of the self-efficacy model (see Figure 1). In conceptualizing the model, respective mediating constructs were determined based on both revelations from the interviews and face validity value of potential effects of individual self-efficacy for exercise, drawn from self-efficacy

**TABLE 1** Informants With BMI  $>25$  ( $N = 7$ )

Name (alias)	Age	Ethnicity/ race	Employment	Marital status	Place of residence
Anne	20	African American	College student	Single	New Orleans, LA
Eva	21	European American	Social service specialist	Single	New York, NY
Stephanie	37	European American	Secretary	Single	Fayetteville, AR
Nancy	50	Asian American	Claim assistant	Married	New Orleans, LA
Storm	28	Asian American	Hairstylist	Married	Nashville, TN
Virginia	35	Latino American	Purchasing manager	Divorced	Austin, TX
Barbara	46	African American	Health care professional	Single	Indianapolis, IN



**FIGURE 1** Original self-efficacy model.

theory (Bandura, 1986, 1997). This structural model illustrates the impact of self-efficacy and meditational factors on exercise regularity.

Potential findings from this research may provide a foundation for understanding key psychological components related to consumer health and physical activity. Learning more about health preventive orientations can assist social marketers in developing initiatives to encourage behavioral change among Americans in reducing obesity. Specifically, social marketing programs, instituted primarily by nonprofits and governmental agencies, exist to help initiate social change (Andreasen, 2002; Kotler & Roberto, 1989; Rothschild, 1999). Andreasen (2002) advocated guidelines for social marketing's use as a tool to enact change. Importantly, Andreasen recommended that before any interventions are employed to initiate change, consumer research be conducted to better understand the audience being targeted. In accordance with Andreasen's recommendation, we make efforts to provide further understanding regarding individuals' physical activity and health-related behaviors. Understanding the internal influences associated with exercise behavior as well as explaining the mediating relationships between self-efficacy and exercise regularity helps to offer further insight into factors that should be considered in executing more effective social marketing programs that address the obesity epidemic and physical inactivity. Implications for consumers, social marketers, and public policy makers are discussed.

## SELF-EFFICACY AND EXERCISE REGULARITY MODEL

## Self-Efficacy Theory

Self-efficacy theory suggests that perceived self-efficacy plays a central role in thoughts, motivations, and actions (Bandura, 1986, 1997). Even when confronted with difficult obstacles, individuals who are confident in their ability to achieve and set goals are likely to persevere. In contrast, individuals low in perceived self-efficacy are predisposed to avoiding the task altogether. According to self-efficacy theory, four key elements characterize self-efficacy: (a) *social persuasion* via feedback, (b) *mastery experience*, (c) *individual emotional state*, and (d) *modeling*. The model presented in this research explains the relationship between self-efficacy and exercise regularity through constructs associated with self-efficacy rather than serving as components of self-efficacy theory.

Social persuasion, as a component of self-efficacy, includes feedback on one's efforts toward achieving a goal. Social persuasion can embody the responses of family, friends, and those who are a part of an individual's network. The individual's social network provides reactions and responses (e.g., favorable or unfavorable) to the results of one's weight management efforts. Such responses serve as social persuasions to influence individual level of health consciousness. For example, (un)favorable feedback may influence one to become more (less) health conscious about their weight. Thus, both self-efficacy and health consciousness should impact health-related behaviors.

The self-efficacy component of mastery experience implies persistence as one is working toward a challenging goal. In the context of health-related behavior and weight loss, the self-efficacy component of mastery experience impacts perceived goal progress toward one's ideal weight. In other words, how hard one is persistently working at losing weight influences the perception of progress toward achieving a goal. The greater the persistence toward taking actions to lose weight, the closer the perceptual distance to accomplishing the set goal. Thus, self-efficacy and perceived goal progress together should influence health behavioral decisions.

Further, as a component of self-efficacy, individual's emotional state includes his/her subjective assessment toward an activity. In the case of preventative health behaviors, an emotional state (i.e., negative or positive) can influence one's attitude toward exercise. For example, if one is in a negative (positive) emotional state that day, one is less (more) inclined to exercise that day. Further, overall attitude toward exercise in general can also influence exercise regularity. Accordingly, self-efficacy and attitude toward exercise is linked to exercise behavior.

Finally, the self-efficacy component of modeling serves to represent individual need to determine similarities (differences) of one's current state to a reference (ideal) model. In discerning health-related behavior as it

relates to self-efficacy, such interpretations of how satisfied one is with their current weight (relative to evaluating ideal weights in modern society) is influenced by the modeling component of self-efficacy. The continual evaluation of the ideal weight impacts the degree of satisfaction level toward one's current weight (i.e., the closer to the ideal weight, the greater the satisfaction level). As a result, self-efficacy and satisfaction toward one's weight should be linked to exercise behaviors.

### Self-Efficacy and Exercise Regularity

Physical activity serves as one central solution to reducing potential health complications when it comes to problems associated with obesity. The four sources of self-efficacy help explain a key component of the protection motivation theory (Rogers, 1983), which posits that people are naturally motivated to protect themselves against harm. The interviews conducted with overweight and obese individuals for this research suggest that these individuals made concerted efforts to engage in physical activity, however, perceived self-efficacy seemed to be lacking when it came to maintaining exercise regularity. Such was the case for at least two of our interviewees who had made futile attempts to establish an exercise regimen.

I used to try to exercise. I don't enjoy it. I have worked with three trainers. As you get older you get worn out and then you get tired because it has not been very successful. (Barbara)

I really don't care to exercise. I realize I should do it. I try to go walking sometime, but it is so hard to be consistent. (Anne)

Health preventive behaviors such as exercise are a critical part of reducing the potentially destructive effects of obesity. Both external factors and internal factors influence exercise behavior. Internal factors related to key elements of self-efficacy greatly impact exercise behavior and are positively associated with one's readiness to change (O'Hea et al., 2004). Such internal factors of health consciousness, goal progress, and attitudes toward exercise and satisfaction with weight are discussed next.

## BACKGROUND AND HYPOTHESES

### Health Consciousness

The motivations to protect oneself against health hazards as well as social acceptance play a role in influencing individual health consciousness. Health consciousness is an indicator of individual overall interest in issues related

to general health and health-related consumption. According to protection motivation theory (Rogers, 1983), people's motivations or intentions to protect themselves from harm is derived from various cognitions and perceptions—one of which is self-efficacy at performing a task that helps to reduce the risk of harmful behavior in question. The motivation to be healthy is indicative of an individual wanting and willing to take care of oneself through engaging in preventative health behaviors (Moorman & Matulich, 1993; Dutta-Bergman, 2004). For example, actively searching for relevant information pertaining to individual health, participating in healthier consumption choices, and engaging in daily exercise serve as indicators of individual level of health consciousness.

As research suggests, health consciousness is linked to preventative health choices such as healthy eating. Those not as health conscious are more likely to participate in making poor health choices and not exercising regularly (Dutta & Youn, 1999; Rafiroiu, Sargent, Parra-Medina, Drane, & Valois, 2003). Individuals with high levels of perceived self-efficacy are more likely to engage in preventative health behaviors such as exercise since they believe they have the ability to achieve set health goals. Additionally, individuals with high self-efficacy may be able to resist the desire to be lured in by advertisements promoting unhealthy consumption experiences.

I see the commercials for the diet food on TV. They actually tell you, you eat this, you eat that, you will lose pounds. Even though the food will help you, but then you have to do exercise, you have to exercise, control your eating. You just can't depend on that food. It's really tempted me, but after that I think about it, I said no, whole food and exercise is better. (Nancy)

I was raised to be healthy. My mom and dad really like to cook, so we ate in a lot. I wasn't raised around the fast foods . . . Whenever I see an advertisement for a Big Mac, I say that's definitely not how it really looks and after you don't eat it for awhile you think it looks incredibly disgusting. It is lathered in like butter. Have you heard of Applebees? I saw a commercial for that on TV the other night—it just didn't look good. I don't know . . . I guess if you're really eating healthy, it doesn't appeal to you as much. Yeah, I don't think they're [commercials] convincing at all, and generally they're not truthful. (Eva)

Levels of health consciousness entail the influences of social persuasion as a defined component of self-efficacy. Based on the social persuasion tenet of self-efficacy theory, mere responses to one's efforts toward achieving set health goals may influence (i.e., encourage or discourage) health-related behaviors such as exercise. For example, individuals who are overweight or obese with high levels of perceived self-efficacy receiving favorable and encouraging social responses may become more health conscious and thus



are more likely to continue the health-related behaviors. Those with low levels of perceived self-efficacy are less likely to be health conscious and therefore are less likely to be interested in exercising regularly. Thus, both self-efficacy and health consciousness should impact health-related behaviors. Based on self-efficacy theory (Bandura, 1986, 1997), protection motivation theory and recent health-related research, the following is proposed:

*H1a:* There is a positive relationship between self-efficacy and health consciousness.

*H1b:* There is a positive relationship between health consciousness and exercise.

*H1c:* There is a positive relationship between self-efficacy and exercise.

*H1d:* Health consciousness will partially mediate the relationship between self-efficacy and exercise.

### Goal Progress Toward Ideal Weight

In accordance with Bandura's (1986, 1997) self-efficacy theory, the mastery experience component of self-efficacy suggests that a part of building self-efficacy requires a sensation of accomplishment through persistence. Perceived self-efficacy toward achieving one's ideal weight influences the perceived progress toward an ideal goal. Goals are the underlying motives behind behaviors. Thus, an individual's current weight in comparison to their ideal weight is a critical factor in understanding issues of health-related choices. Many Americans seek to be healthy by attaining an ideal healthy weight; however, many have difficulty attaining this health goal. Part of this is due to food-related consumption.

It is difficult for my family and me to lose weight. I guess we feel like we don't have the time to exercise or to figure out what's right to eat and what's good and not good. (Anne)

Often people have competing goals, one being a taste gratification goal while the other a health maintenance goal; therefore a continuous struggle exists (Dhar & Simonson, 1999; Fishbach, Friedman, & Kruglanski, 2003). Studies suggest that goals are linked to motivation; specifically, goals cause individuals to work harder in finishing a mission (Brendl, Markman, & Messner, 2003). As individuals progress toward their goals, motivations are heightened due to the actual progression toward accomplishing the set goals (Soman & Shi, 2003). In the context of exercise, relatively fewer studies have examined the relationship between self-efficacy

and physical activity (Patterson et al., 2006). However, Rimal's (2001) study did find that individuals believing in their ability to control their health behaviors were more likely to engage in increased exercise behavior. Persistently working to losing weight influences the perception of progress toward achieving a goal. The greater the mastery toward taking actions to lose weight, the smaller the perceptual distance to accomplishing the set goal. Self-efficacy in combination with perceived progression toward an individual's ideal weight should enhance one's willingness to exercise regularly. Thus, the following is predicted:

*H2a:* There is a positive relationship between self-efficacy and goal progress toward ideal weight.

*H2b:* There is a positive relationship between goal progress toward ideal weight and exercise.

*H2c:* Goal progress toward ideal weight will partially mediate the relationship between self-efficacy and exercise.

Research demonstrates that motivation increases as one progresses toward accomplishing a goal (Soman & Shi, 2003). Hence, self-efficacy in combination with perceived progression toward an individual's ideal weight may enhance one's willingness to exercise regularly. However, as discussed in the following section, in addition to motivation, an individual's subjective assessment about exercise, or attitude about exercise, may also impact exercise regularity.

### Attitude Toward Exercise

Emotional states can influence episodic and general attitude toward an object or activity. According to self-efficacy theory (Bandura, 1986, 1997), the self-efficacy component of an individual's emotional state comprise the overall assessment and evaluations of potential outcomes. In the case of health-related behaviors such as exercise, emotional states have the potential to influence the decisions to exercise. Positive (negative) emotional states are more (less) likely to encourage exercise for a particular episode in time. Emotional states also serve to provide information for future reference. For example, positive emotional states reflect favorable emotional responses while negative emotional states reflect unfavorable emotional responses. Previous memory and knowledge structures of emotional responses provide information to influence individual attitude. As such, antecedents of attitude include past learned experiences from engagement in a behavior (Epstein & Saelens, 2000). Outcomes resulting from a behavior, whether

considered positive or negative consequences, influence the likelihood a behavior will continue to occur.

I've never really had a successful time with an [exercise] trainer, so that I could go back to her saying, "Oh I lost 30 pounds here and I look like this." So that's why I just don't have very much faith in personally me going back to one and giving her my money. (Barbara)

Past behaviors exhibiting unfavorable consequences tend to be discarded in the future, whereas favorable consequences serve to reinforce future behaviors. Research has shown that favorable consequences such as enjoyment of an activity or seeing the progression toward a goal can enhance the specific behavior (Wankel, 1993). For example, the degree of enjoyment derived from the participation in physical activities is predictive of exercise frequency in both children and adults (Wankel, 1993). Hence, attitude toward exercise plays a considerable role in the successful compliance of a healthy, long-term exercise regimen. Further, research demonstrates that self-efficacy and positive attitudes toward physical activity are related to an increase in the engagement of physical activity (C. B. Anderson, Hughes, & Fuemmeler, 2009; Trost, Owen, Bauman, Sallis, & Brown, 2002). Thus, the following is predicted:

*H3a:* There is a positive relationship self-efficacy and attitude toward exercise.

*H3b:* There is a positive relationship between attitude toward exercise and exercise.

*H3c:* Attitude toward exercise will partially mediate the relationship between self-efficacy and exercise.

The progression of accomplishing a set goal has been shown to enhance both motivation and performance toward a goal (Soman & Shi, 2003). As an antecedent to the formulation of an attitude, seeing an individual's own accomplishments toward a goal should produce favorable attitudes toward the behavior and consequently reinforce the action. Therefore, the following is predicted:

*H4a:* There is a positive relationship between goal progress toward ideal weight and attitude toward exercise.

*H4b:* Attitude toward exercise will partially mediate the relationship between goal progress toward ideal weight and exercise.

## Satisfaction With Weight

The self-efficacy component of modeling represents assessment of differences between actual state and the ideal model. As a component of self-efficacy, referencing the ideal model augments one's level of self-efficacy. In the context of health-related behaviors for example, the evaluation of the distance between actual and ideal states (i.e., self-efficacy) impacts satisfaction with the current weight. If individual self-efficacy is high (low) for weight loss attempts as one is closer to (farther from) the ideal model, satisfaction levels with individual weight adjusts accordingly.

Individuals often have positive expectations about behavioral change outcomes. This is consistent with many classic cognitive theories on behavior (Ajzen & Fishbein, 1980; Deci & Ryan, 1985; Bandura, 1986; Ajzen, 1991). Such is certainly the case when individuals make attempts to lose weight. However, behavioral change outcomes do not always meet with success. In fact, even if an individual is successful at losing weight, they may have difficulty maintaining the weight loss (Jeffery et al., 2000). Recurring points made by interviewees addressed the problems they experienced with both their weight loss goals and weight maintenance attempts:

I would like to lose some weight. I'm trying to lose at least between 10–15 pounds. (Virginia)

Maintaining my weight is hard as hell. Losing my weight is hard as hell. (Baby Blue)

Critical determinants of satisfaction toward individual weight loss are dependent upon the initial expectation that help motivate health-related behaviors (Polivy & Herman, 2000, 2002; Rothman, 2000). Satisfaction with individual weight can be high among individuals who are at their ideal weights or who are progressing satisfactorily toward their weight goal. Research indicates that there is a link between satisfaction and weight maintenance (Head & Brookhart, 1997); further, positive outcome expectation and satisfaction are associated with weight loss (Finch et al., 2005). Thus, based on the tenets of self-efficacy theory and previous research on the influences of satisfaction, the following is proposed:

*H5a:* There is a positive relationship between satisfaction with individual weight and goal progress toward ideal weight.

*H5b:* Goal progress toward ideal weight will partially mediate the relationship between satisfaction with individual weight and exercise.

## METHODOLOGY

### Qualitative Approach

This research employed both qualitative and quantitative approaches to examine the influences of self-efficacy on exercise regularity. In-depth interviews were conducted to generate textual data for initial analysis (McCracken, 1988). To recruit informants, advertisements were posted in neighborhood community centers and local retailers, requesting interviews with individuals interested in the topic of obesity and weight loss attempts through exercise.

In an initial pool, 14 individuals who answered the ads were screened for this research by answering opened-ended questions about whether they were attempting to lose weight and how frequently they engaged in weight loss attempts through physical exercise. Individuals were also asked to provide information on their weight and height to rule out potential outliers. Seven informants that were diverse in race/ethnicity, occupation and marital status were then selected based on their responses to these questions and their ability to openly share their experiences and feelings regarding physical exercise (see Table 1).

Informants were from several medium sized cities in the United States. Two of the informants were African American, two were Asian American, one was Hispanic and two were Caucasian. Informants ranged in age from 20 to 50 and were from diverse locations in the United States, including Louisiana, Texas, Arkansas, Tennessee, New York, and Indiana. After the interviews, each informant was compensated \$10 for participating.

All interviews were recorded and professionally transcribed. After thorough reading of the textual data, themes emerged across informants' interviews and were then analyzed through consensus of the authors (McCracken, 1988; Thompson 1997). This allowed for a more thorough comprehension of the discourses surrounding self-efficacy and exercise behavior.

### Quantitative Approach

Following the interviews that were conducted with the seven individuals regarding their health and exercise behavior, a survey instrument was developed that was administered to 233 people living in the southern part of the United States. Participants ranged in age from 20 to 45 and the mean age of 24. To ensure rigorous testing, structural equation modeling was used to test the hypotheses as this form of analysis requires individual construct validity to be appropriate in addition to the model fitting theory requirements. Self-efficacy served as the exogenous variable while exercise regularity served as the endogenous variables. Mediating variables included health consciousness, goal progress toward ideal weight, attitude

toward exercise and satisfaction with current weight. The self-efficacy for exercise measure was adapted from the scale used by Marcus, Selby, Raymond, and Rossi (1992) with appropriate reliabilities ( $\alpha = .87$ ). Health consciousness was adapted from the scales used by Kraft and Goodell (1993) and Jayanti and Burns (1998), which consisted of a 7-point scale with endpoints of *strongly disagree* and *strongly agree*: (a) I am very health conscious in the food and beverage choices I make for my family and/or myself; (b) Reading nutrition facts on the food and beverage items I buy is part of my normal shopping routine; (c) I watch the number of calories that I consume; and (d) I don't worry about the nutritional content of a food product. Further, a bipolar scale with endpoints of *not at all health conscious* and *extremely health conscious* was used to address the question: How health conscious would you say you are? Reliabilities are adequate for the health consciousness measure ( $\alpha = .86$ ). The goal progress toward ideal weight measure was created and adapted based on Fishbach and Dhar's (2005) manipulation of perceived goal progress to include a three, multi-item scale consisting of "little progress/much progress," "far from ideal weight/close to ideal weight," and "small progress toward ideal weight/big progress toward ideal weight." The reliability for the goal progress toward ideal weight measure was appropriate at .83. The overall attitude toward exercise measure included a three, multi-item scale including endpoints of "unfavorable/favorable," "bad/good," and "negative/positive" (Homer, 1995). Reliabilities for the attitudinal measure was appropriate ( $\alpha = .92$ ). The measure of satisfaction with current weight consisted of a three, multi-item scale with endpoints including "dissatisfied/satisfied," "displeased/pleased," and "unfavorable/favorable" (Price & Arnould, 1999; Jones, Mothersbaugh, & Beatty, 2000) with adequate reliability ( $\alpha = .98$ ). Exercise regularity was determined through the question: How often do you exercise?, which included the use of an adapted three, multi-scale including "infrequently/frequently," "seldom/often," and "never/always" (Dahl, Manchanda, & Argo, 2001; Sen, Gurhan-Canli, & Morwitz, 2001). Cronbach's alpha for the exercise regularity measure were adequate at .96.

## RESULTS

An analysis of the model was performed in Amos Graphics 17.0 using the maximum likelihood estimation method. Data analysis was conducted using the two-step procedure proposed by J. C. Anderson and Gerbing (1988). First, the measurement model was assessed and then the structural model was tested.

### Measurement Model

As previously discussed, many of the constructs in this study were measured using existing and established scales taken from the behavioral literatures.

In addition to employing standard statistical techniques (e.g., performing exploratory factor analysis, examining item-to-total correlations, obtaining Cronbach alphas) to assess the model for construct and discriminant validity, confirmatory factor analysis was performed. From the self-efficacy scale, items reflecting the social persuasion component of the self-efficacy measure were of interest; other items of the measure were eventually removed from the self-efficacy scale in order to improve fit. The final measurement model then exhibited adequate fit ( $\chi^2 = 545.17$ ,  $df = 215$ ,  $p < .01$ , CFI = .93, IFI = .93, TLI = .91, RMSEA = .08). To test for convergent validity, factor loadings, along with the average variance extracted were calculated for each latent variable. An examination of the standardized factor loadings revealed that all the loadings exceeded the .6 threshold (see Table 2). The measurement model exhibited adequate fit ( $\chi^2 = 545.17$ ,  $df = 215$ ,  $p < .01$ , CFI = .93, IFI = .93, TLI = .91, RMSEA = .08). To test for convergent validity, factor loadings, along with the average variance extracted were calculated for each latent variable. An examination of the standardized factor loadings revealed that all the loadings exceeded the .6 threshold (ranged from .60 to .99) as recommended by Hair et al. (2006). Additionally, as seen in Table 3, the average variance extracted for each construct exceeded the recommended rule of thumb of .5 (Hair, Babin, Anderson, & Tatham, 2006), which is an indication that the variance captured by the construct is greater than the variance due to measurement error.

In order to assess discriminant validity, the Fornell Larcker test (1981) was performed. Discriminant validity is demonstrated when average variance extracted for a construct is greater than the squared correlations between that construct and other constructs in the model. The average variances extracted between each construct is greater than the squared multiple correlations for each construct pairing.

**TABLE 2** Means, Standard Deviations, Reliabilities, Average Variance Extracted, and Pearson Correlations

	<i>M</i>	<i>SD</i>	Reliability	AVE	Exercise	ATE	GP	SAW	HC	SE
Exercise (E)	5.0	0.78	.99	.90	1.00					
Attitude toward exercise (ATE)	6.1	1.05	.96	.81	.34 <sup>a</sup>	1.00				
Goal progress (GP)	4.7	1.71	.97	.67	.38 <sup>a</sup>	.39 <sup>a</sup>	1.00			
Satisfaction with actual weight (SAW)	4.44	1.33	.99	.91	.25 <sup>a</sup>	.14 <sup>b</sup>	.63 <sup>a</sup>	1.00		
Health consciousness (HC)	3.96	1.0	.97	.58	.14 <sup>b</sup>	.26 <sup>a</sup>	.21 <sup>a</sup>	.02	1.00	
Self-efficacy (SE)	2.81	1.48	.95	.50	.26 <sup>a</sup>	.07	.17 <sup>b</sup>	.07	.29 <sup>a</sup>	1.00

<sup>a</sup>Significant at .01 level. <sup>b</sup>Significant at .05 level.

**TABLE 3** CFA Factor Loadings

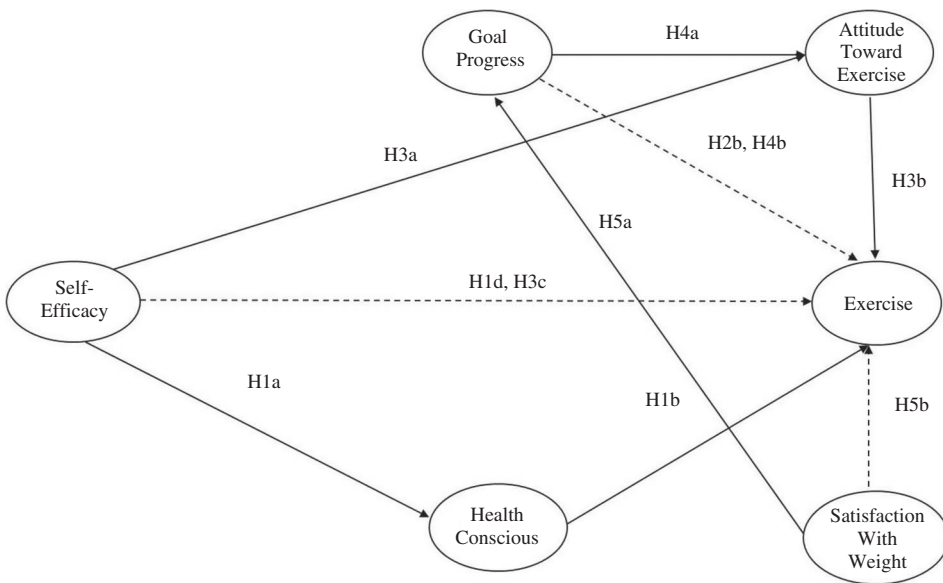
Item	E	ATE	GP	SAW	HC	SE
1	0.97	0.80	0.93	0.98	0.84	0.60
2	0.99	0.96	0.64	0.99	0.84	0.67
3	0.89	0.93	0.86	0.96	0.891	0.61
4						0.93
5						0.93

Note. E = exercise; ATE = attitude toward exercise; GP = goal progress; SAW = satisfaction with actual weight; HC = health consciousness; SE = self- efficacy.

Reliabilities were calculated for each construct to ensure that each exhibited internal consistency. All measures exemplified acceptable reliability by exceeding the recommended .7 threshold (Nunnally & Bernstein, 1994; Hair et al., 2006). See Table 3. The results from the structural analysis follow.

Structural Model

The structural model and hypotheses were evaluated after attaining a validated measurement model. The original and final model (see Figure 1 and Figure 2) exhibited a good model fit:  $\chi^2$  (547.991); *p*-value (.000); CFI (.931); RMSEA (.080); and PCLOSE (.000). Figure 1 displays the original model, while Figure 2 displays only paths of supported hypotheses. Hypotheses 1



**FIGURE 2** Final self-efficacy model.



through 5 proposed both direct and mediated effects between latent variables and the primary dependent variable of exercise regularity.

#### HEALTH CONSCIOUSNESS AND EXERCISE REGULARITY

H1a through H1c specify direct effects. The results of these direct effects are presented in Table 4. H1a predicted that self-efficacy would be positively related to health consciousness. As seen in Table 4, H1a was supported ( $\beta = .443$ ;  $SE = .149$ ;  $p < .05$ ). This indicates that higher levels of perceived self-efficacy are associated with increased frequency of exercise behavior. Moreover, H1b proposed that health consciousness would be positively related to exercise. This hypothesis was also validated ( $\beta = .279$ ;  $SE = .061$ ;  $p < .05$ ), revealing that higher levels of health consciousness is correlated with exercise regularity. As predicted in H1c, self-efficacy would be positively related to exercise regularity, and this prediction was marginally supported ( $\beta = .131$ ;  $SE = .113$ ;  $p > .05$ ). Results were in the appropriate direction but did not yield significant results. Next, H1d predicted that health consciousness will partially mediate the relationship between self-efficacy and exercise. Results from the Sobel Test confirm the indirect effect ( $\beta_1 = .443$ ;  $\beta_2 = .279$ ;  $IE = .131$ ;  $p < .05$ ). Thus, health consciousness fully mediates the relationship between self-efficacy and exercise regularity.

#### GOAL PROGRESS TOWARD IDEAL WEIGHT

H2a and H2b denote direct effects along with specific directionality of these predictions, while H2c specify a mediational relationship. H2a proposed that emotional self-efficacy would be positively related to goal progress toward an individual's ideal weight. Results for H2a were in the appropriate direction ( $\beta = .122$ ;  $SE = .100$ ;  $p > .05$ ), however did not reach statistical significance. Further, H2b predicted that goal progress toward ideal weight would be positively related to exercise regularity. The results support the H2b prediction ( $\beta = .212$ ;  $SE = .090$ ;  $p < .05$ ), which indicates that greater progress toward ideal weight is associated with exercise regularity. H2c predicted that goal progress toward ideal weight would partially mediate the relationship between self-efficacy and exercise regularity. The nonsignificant path between self-efficacy and goal progress toward ideal weight ( $\beta = .122$ ;  $SE = .100$ ;  $p > .05$ ) does not satisfy the requirements for partial mediation, therefore H2c is not supported.

#### ATTITUDE TOWARD EXERCISE

H3a through H4b specify both direct and mediating effects. H3a predicted that self-efficacy would be positively related to attitude toward exercise. Results corroborate this prediction ( $\beta = .253$ ;  $SE = .080$ ;  $p < .05$ ).

**TABLE 4** Hypotheses

	Hypotheses	Unstandardized coefficient	Critical ratio	<i>p</i> -value	Hypothesis
H1a:	Self-Efficacy →	0.443	2.980	<.05	Supported
H1b:	Health Consciousness →	0.279	4.542	<.001	Supported
H1c:	Self-Efficacy →	0.131	1.158	>.05	Not supported
H2a:	Self-Efficacy →	0.122	1.222	>.05	Not supported
H2b:	Goal Progress →	0.212	2.351	<.05	Supported
H3a:	Self-Efficacy →	0.253	3.158	<.05	Supported
H3b:	Attitude Toward Exercise →	0.258	2.548	<.05	Supported
H4a:	Goal Progress →	0.147	3.198	<.05	Supported
H5a:	Satisfaction Toward Weight →	0.495	10.185	<.001	Supported

**TABLE 5** Mediation Hypotheses

Mediation hypotheses			Coefficient Path 1	Coefficient Path 2	Sobel test <i>p</i> -value	Hypothesis
H1d:	Health Consciousness	→	0.443	0.279	<.05	Supported
H2c:	Goal Progress Toward Ideal Weight	→	0.122	0.212	>.05	Not Supported
H3c:	Attitude (Self-Efficacy on Exercise)	→	0.253	0.258	<.05	Supported
H4b:	Attitude (Goal Progress on Exercise)	→	0.147	0.258	<.05	Supported
H5b:	Satisfaction With Weight	→	0.495	0.212	<.05	Supported

Subsequently, higher levels of self-efficacy are linked to more favorable attitudes toward exercise. Correspondingly, H3b proposed that attitude toward exercise would be positively related to exercise and results confirm this prediction ( $\beta = .258$ ;  $SE = .101$ ;  $p < .05$ ). This indicates that favorable attitudes toward exercise are correlated with greater exercise regularity. H3c predicted that attitude toward exercise will partially mediate the relationship between self-efficacy and exercise. As specified by Baron and Kenny (1986) for the assessment of mediation, if the direct effects are significant, then the indirect effect is also significant. Additionally, the significance of the indirect path was corroborated by using the Sobel test. Results partially confirm H3c. Attitude toward exercise fully mediates the relationship between self-efficacy and exercise ( $\beta_1 = .253$ ;  $\beta_2 = .258$ ;  $IE = .131$ ;  $p < .05$ ) instead of partially mediating this relationship as initially predicted.

H4a predicted that goal progress toward ideal weight would be positively related to attitude toward exercise and results support this prediction ( $\beta = .147$ ;  $SE = .046$ ;  $p < .05$ ). This indicates that greater goal progress toward ideal weight is associated with more favorable attitudes toward exercise. Further, H4b proposed that attitude toward exercise would partially mediate the relationship between goal progress toward ideal weight and exercise regularity. Results from the Sobel Test confirm the indirect effect ( $\beta_1 = .147$ ;  $\beta_2 = .258$ ;  $IE = .212$ ;  $p < .05$ ). Thus, attitude toward exercise partially mediates the relationship between goal progress toward ideal weight and exercise regularity.

#### SATISFACTION WITH WEIGHT

H5a through H5b identify both direct and meditational relationships. Specifically, H5a asserted that satisfaction with individual weight would

be positively related to goal progress toward ideal weight. Results validate this prediction ( $\beta = .495$ ;  $SE = .049$ ;  $p < .001$ ). Lastly, H5b predicted that goal progress toward an individual's ideal weight would partially mediate the relationship between satisfaction with individual weight and exercise regularity. The requirements for partial mediation are satisfied due to the significant path between satisfaction with individual weight and goal progress toward ideal weight ( $\beta = .495$ ;  $SE = .049$ ;  $p < .001$ ), the significant path between goal progress toward ideal weight and exercise regularity ( $\beta = .212$ ;  $SE = .090$ ;  $p < .05$ ), and the nonsignificant path between satisfaction with individual weight and exercise regularity ( $\beta = .083$ ;  $SE = .068$ ;  $p > .05$ ). Additionally, the Sobel test confirms ( $\beta_1 = .495$ ;  $\beta_2 = .212$ ;  $IE = .083$ ;  $p < .05$ ) the partial mediation.

## GENERAL DISCUSSION

### Summary of Results

Given the current social problem of obesity, past and current research efforts have examined consumer choice and decision-making regarding food consumption (Kemp et al., 2007; Chandon & Wansink, 2007; Bui et al., 2008; Naylor et al., 2009). However, preventative health behaviors such as exercise are also instrumental in combating the obesity epidemic. Limited studies in the marketing literature have explored how internal and psychological characteristics influence physical activity and exercise regularity. This research demonstrated through both qualitative and quantitative procedures that an individual's perceived self-efficacy as well as mediating factors such as health consciousness, goal progress toward ideal weight, attitude toward exercise and satisfaction with current weight play a considerable role in attaining and maintaining exercise regularity. There were positive relationships between goal progress, attitude toward exercise and exercise regularity; however, goal progress did not mediate the relationship between self-efficacy and exercise regularity. Nonetheless, goal progress did significantly mediate the relationship between satisfaction with current weight and exercise regularity.

From this study, results show that to explain the relationship between self-efficacy and exercise regularity, individual health consciousness must be a part of the equation in explaining health behavior. That is, self-efficacy plays a significant role in influencing health consciousness and both self-efficacy and health consciousness interactively impact exercise regularity. To increase the likelihood that one will engage in exercise regularity, both self-efficacy and health consciousness need positive enforcements. That is, the promotion of higher self-efficacy is critical to influencing individual health consciousness. Encouraging greater health consciousness also serves to increase the likelihood of exercise regularity. Understanding the mediating

influence of health consciousness provides a better understanding of how to strengthen the self-efficacy-exercise regularity relationship—through promoting health consciousness.

Findings from this study also show that attitude toward exercise plays a significant role in explaining the relationship between self-efficacy and exercise regularity as well as goal progress and exercise regularity. The higher (lower) the self-efficacy, the more favorable (unfavorable) the attitude toward exercise. Additionally, the greater (less) the progress toward the ideal weight, the more favorable (unfavorable) the attitude toward exercise. High self-efficacy and greater perceived progress toward ideal weight enhances attitude toward exercise; further this relationship promotes exercise regularity. Attitude toward exercise acts to highlight self-efficacy and goal progress on exercise regularity associations. Inducing favorable attitude toward exercise greatly enhances the understanding of both self-efficacy and stimulating perceived goal progress on exercise regularity. To maneuver the mediational influence of attitude toward exercise, belief systems and knowledge about exercise need to be positively manipulated to either convert unfavorable attitudes toward exercise or encourage continual favorable attitudes toward exercise. Manipulating the attitude toward exercise influence can greatly impact overall self-efficacy and goal progress on exercise regularity.

Lastly from this study, results showed the positive influence satisfaction with current weight had on goal progress toward ideal weight. The perceived progress toward individual ideal weight further illuminates the relationship between satisfactions with current weight on exercise regularity. Manipulating perceived goal progress can strengthen the satisfaction-exercise regularity relationship. For example, if one were to set smaller interval weight loss goals (i.e., losing 5 pounds at a time instead of 25 pounds at a time), the perception of goal progress drastically increases. Greater satisfaction with current weight along with favorable perceptions of goal progress toward ideal weight increases motivations to exercise regularly.

Research suggests that self-efficacy is a strong predictor of physical activity (Troost et al., 2002). Nonetheless, findings from this research indicate that the decision to exercise is not just attributed to self-efficacy alone. Instead, to best explain the relationship between self-efficacy and exercise, mediating influences including health consciousness, goal progress, attitude toward exercise, and weight satisfaction levels play important roles in determining exercise regularity. Through examination of these relationships, a basis is provided from which actions might be taken to influence exercise regularity. Understanding the influencing of mediating factors contributing to the self-efficacy and exercise regularity model contributes to finding potential solutions to promote exercise regularity and reducing overweight and obesity statistics.

## Implications of Findings

MacInnis, Moorman, & Jaworski (1991) proposed that motivation, opportunity, and ability (MOA) influence consumers' level of processing, which has been used in the development of advertising campaigns. Rothschild (1999) later used the MOA framework for assessing the value of public health and social marketing issues. We apply the MOA framework to the findings of our research in promoting attitude and behavior change towards physical activity.

### MOTIVATION

Motivation is a goal-directed arousal (MacInnis et al., 1991) and individuals are typically motivated to behave in certain manners when they discern that their self-interest will be served. In the model presented in this research, satisfaction with current weight and progress toward ideal weight were mediating influences on exercise regularity. Individuals were more inclined, or motivated, to engage in exercise activity when they felt they were making marked progress toward losing weight. Research demonstrates that individuals must be motivated to make a change in their health state, especially with regard to exercise and weight loss (O'Hea et al., 2004; Hoyer & MacInnis, 2004; Goldberg & Gunsati, 2007). However, during the process of losing weight, an individual may experience fluctuations in satisfaction regarding progress toward their ideal weight. Understanding that these fluctuations will occur is pivotal in the motivation process. This awareness can better equip and prepare individuals for the various attitudinal and emotional responses they will experience toward their health efforts. Such understanding can help promote persistence in healthy decision-making and choices, including exercising. Subsequently, initiatives aimed at promoting the benefits of physical activity and encouraging individuals to stay persistent and consistent in physical and exercise activity should be implemented. This might occur by using various media outlets to help individuals stay motivated and cognizant of health choices.

### OPPORTUNITY

Health consciousness and attitude toward exercise also served as internal factors that impact exercise regularity in the model presented in the present research. However, these factors can be addressed through external means. For example, according to Rothschild (1999) individuals may lack opportunity to act because there is no environmental mechanism available (Rothschild, 1999). Specifically, marketers and public policy makers can encourage behavioral change by increasing consumer opportunity (Hoyer & MacInnis, 2004; Goldberg & Gunsati, 2007). Several ways in which

this can be done is by making exercise amenities more accessible, adopting physical activity programs in schools (Cavill & Maibach 2008) and creating community-based campaigns to promote physical activity (Reger, Cooper, & Booth-Butterfield, 2002). Seeing others engaged in physical activity can have a positive effect on individuals' health choices.

#### ABILITY

Social marketing can also affect psychosocial variables, such as self-efficacy, to increase an individuals' perceived ability to engage in exercise behavior. As this research demonstrated, individuals who had high expectations of achievement, or self-efficacy, showed greater ability to participate in exercise regiments. Marketing tools which might be used to promote self-efficacy and consumer ability include social media forums. Such platforms can be specifically useful at disseminating information and supporting and reinforcing the adoption of healthier lifestyles (Easterling, 2001). Additionally, as these same outlets are used to develop support groups, the sharing of experiences and struggles can help individuals when motivation is lacking. As a result, social marketing efforts can be instituted to help create behavior change (Griffin & O'Cass, 2004; Newton-Ward, 2007).

Finally, marketers can help educate and promote health consciousness through health-related events and programs addressing the need for more physical activity among both children and adults. Aligning favorable brands to the concept of healthier living through physical activity further develops brand equity for the firm while also enhancing consumer welfare by changing possibly negative attitudes toward exercise. As negative attitudes toward physical activity become more positive, motivation, opportunity, and ability for engaging in exercise behavior should increase.

#### Limitations and Future Research

This research provides further understanding about how perceived self-efficacy as well as meditational factors impact exercise regularity. However, it is not without limitations. The sample used in this research consisted primarily of cross-sectional data and of younger adults. Although good decision making regarding health behaviors should begin early, future research endeavors regarding exercise regularity and self-efficacy might include a more heterogeneous sample with regard to age and geographical locations. Further, the model presented in this research examines relationships among self-efficacy and four internal factors. Other components of health behavior and decision-making might be considered. For example, examining other potential mediating factors such as rigid eating restraints, prosocial environments, and interest in nutrition on the self-efficacy to exercise regularity

linkage may offer additional ways in which consumers and marketers can manipulate internal factors to increase exercise regularity.

Also, additional research might explore causal relationships between some of the factors presented in the model in this research such as ideal weight progression, weight satisfaction and exercise regularity. In other words, we have determined that there are significantly positive relationships between these meditational variables and exercise regularity, however research to determine if manipulating these constructs in an experimental setting to produce actual outcomes of exercise regularity warrants attention.

Finally, this research proposes that marketers and public policy makers can increase individuals' motivation, opportunity and ability to engage in physical activity by creating awareness through various media outlets, making exercise amenities more accessible and developing health-related events. Future research might address the effectiveness of initiatives implemented to encourage physical activity. For example, per the implication of the findings in this study, determining if media outlets such as social media forums, community-based campaigns effectively motivate or promote health consciousness and physical activity are needed. Also, does the accessibility to exercise facilities, social support and seeing others make a significant difference in motivating people to engage in physical exercise? Pre-posttests can be done to determine the effectiveness of such implementations. Lastly, in aligning favorable brands with the concept of healthier living, can this strategy effectively induce favorable attitudes toward exercise and thus positively encourage exercise regularity?

Much research and further understanding is warranted in the area of health-related consumption decisions and obesity. As the obesity problem continues to become a growing concern not just in the United States but around the world, social marketers and public policy makers must find creative ways to encourage consumers to pursue healthier lifestyles.

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