Potentially Misleading Weight Loss Advertisements Targeting Men: Examining Influence of Celebrity Athlete Endorsement on Ad Believability and Purchase Intentions

Andrew C. Pickett, PhD
Katie M. Brown, PhD
Zack J. Damon, MBA, PhD
Natasha T. Brison, JD, PhD

Abstract

Given the prevalence of false or exaggerated claims in advertisements for weight loss products, as well as risks associated with use of unproven dietary supplements and exercise plans, they are subject to heightened scrutiny from regulators. However, celebrity athlete endorsers are increasingly featured in advertisements promoting weight loss products targeting men. This study employed a 2 x 2 (athlete endorser vs. non-celebrity; plausible vs. unrealistic advertising claim) experimental design, whereby participants ($n = 292$) were exposed to one of four ad conditions. Results suggest the athlete endorser was perceived as more credible than a non-celebrity, being rated as more expert. We found statistically significant differences in ad believability, fit perceptions, brand attitudes, and purchase intentions. Findings suggest that the presence of a celebrity athlete endorser made weight loss advertisements more believable to consumers, even when ads contained obviously false claims. Given the health risks associated with certain weight loss behaviors and supplements, the impact of celebrity endorsers on consumer choices is important. We discuss the implications for potential consumers, regulators, and celebrity athlete endorsers.

*The corresponding author may be reached at: picketac@iu.edu

Introduction

Celebrity and athlete endorsers have become common in advertisements for health-related products and services, such as sporting equipment, medications, nutrition supplements, and fitness services (Braunstein-Minkove et al., 2011; Chi et al., 2009). Advertisements featuring well-known endorsers are particularly effective because consumers perceive strong associations between the celebrity's brand and the product or service they promote (Chi et al., 2009; Hsu & McDonald, 2002). Thus, the organization benefits from leveraging positive feelings consumers have about the endorser, thereby increasing the perceived value of its product or service and gaining a competitive advantage in the marketplace (Chi et al., 2009). This is important, as consumers' perceived value of a product or service is a well-established, necessary component of consumption behaviors.

Weight loss products and supplements represent one health-related product category in which the use of celebrity athlete endorsers has become particularly salient (Verriet, 2020). Specifically, athletes are increasingly used in promotional efforts for weight loss products targeting men (Boyd & Shank, 2004; Pickett & Brison, 2019). One study noted Nutrisystem and AdvoCare, both weight loss brands, that were successful in

using athlete endorsers to target male consumers which led to increased purchase intention (Hill, 2015). Therefore, the increasing use of athlete endorsers in weight loss advertisements is not surprising.

Weight Loss Product Advertising, Body Dissatisfaction, and Risky Health Behaviors

Given the ubiquity of health and weight loss-related advertising, there is increasing scholarly interest in the impact of such messages on the health behaviors of viewers (e.g., Rounsefell et al., 2020; Selensky & Carels, 2021). In general, regular viewing of weight loss-related advertisements and social media posts is related to body dissatisfaction (e.g., Brison, Pickett, et al., 2020; Brown & Tiggemann, 2016; Holland & Tiggemann, 2016; Wilson & Blackhurst, 1999). Earlier research focused on this relationship for women (e.g., Tiggemann & McGill, 2004); however, more recent work has found that relationships between weight loss advertising and body dissatisfaction are common among men as well (e.g., Gillen, 2015; Griffiths et al., 2016; Pickett & Brison, 2019).

Importantly, body dissatisfaction and weight bias internalization are related to negative physical and mental health outcomes (Pearl & Puhl, 2018), as well as risky health behaviors (Wu & Berry, 2018). Similar to weight loss advertising-related work, early research on body dissatisfaction focused primarily on its impact on the wellbeing and health behaviors of women (e.g., Kong & Harris, 2015; Wilson & Blackhurst, 1999). However, more recent research suggests similar negative impacts of body dissatisfaction on physical and mental health of men (Barnes et al., 2020; Montgomery Sklar, 2017). Indeed, some researchers found the relationship between body dissatisfaction and psychological distress was stronger among men than women (Griffiths et al., 2016). Furthermore, studies consistently have found body dissatisfaction is related to a number of poor health behaviors, including disordered and/ or binge eating (Braun et al., 2016; Brechan & Kvalem, 2015), increased tobacco and alcohol use (e.g., Gonçalves et al., 2022), and compulsive exercise (Bell et al., 2016). Conversely, positive body image is related to positive health behaviors (Grogan, 2021), such as skin protection (Gillen, 2015). Thus, it is important to understand the impact of weight loss marketing tactics that may promote body dissatisfaction and lead to unhealthy behaviors among viewers.

FTC Regulations and Weight Loss Advertising

The Federal Trade Commission (FTC), the enforcement agency responsible for monitoring advertisements in the United States (U.S.), has raised concerns about false and exaggerated claims in weight loss advertisements (Brison et al., 2020). Such deceptive advertising practices are of particular interest when products present danger to consumers (Sardina, 1999). Unfortunately, the weight loss supplement and products industries are largely unregulated, with many products entering the market having never been tested for efficacy and safety by regulators (Rothblum, 2018; Sardina, 1999). Not surprisingly, many weight loss supplements and diet programs have been shown to be dangerous to consumers and linked to serious medical conditions (e.g., liver failure) (McCarthy et al., 2021; Rothblum, 2018). In other cases, weight loss supplements have been found to include banned, discouraged-use, and/or adulterated substances (Dastjerdi et al., 2018; Eichner et al., 2016; Khazan et al., 2014). Therefore, the products themselves often present health risk beyond the behaviors outlined previously.

In addition, advertising claims for weight loss products are often unsubstantiated, which has led the FTC to take action to combat false advertising practices in the industry (Avery, 2011). Since 1997, the FTC has introduced multiple initiatives, issued cease-and-desist letters, and levied millions of dollars in fines to reduce false weight loss claims (e.g., Operation Waistline, Operation Failed Resolution). One such initiative defines several common but plainly false advertising claims made in weight loss promotions as "Red Flag Claims" (Brison et al., 2020). Among the most common Red Flag Claims are promises that products allow users to lose more than two pounds per week without dieting or exercise, lose substantial weight, no matter what the consumer eats, experience permanent weight loss (even after product stoppage), block the absorption of calories or fat into the body, lose weight by wearing/applying the product externally, or that the product can cause weight loss for all users (Brison, Pickett, et al., 2020). Federal regulations define an advertisement as deceptive if it contains statements that may mislead a *reasonable* consumer and could affect purchase decisions (Brison et al., 2020). Relevant to this study, the presence of athlete and celebrity endorsers may enhance credibility for false or misleading weight loss claims in the advertisements, which may put unsuspecting individuals at risk (Brison et al., 2013).

Endorser Credibility, Believability, Perceived Fit, and Purchase Intentions

Previous research shows that when consumers perceive an endorser to be credible, there is a significant effect on product-related attitudes (Spry et al., 2011). In one framework, the Source Credibility Model, endorser credibility is defined as having three underlying dimensions: attractiveness, trustworthiness, and expertise

(Ohanian, 1990). High levels of credibility for a claim in advertising are generally associated with increased believability, which results in more favorable attitudes toward the product, higher purchase intentions, and a willingness to pay higher prices (Erdogan, 1999). When viewing advertisements, consumers further evaluate the ability of a product or service to meet their individual wants and needs. That is, consumers search for information and advertising signals that the product will meet their needs, often referred to as perceived fit (Stankevich, 2017). Taken together, these conceptual frameworks suggest that the use of athlete endorsers may increase credibility (and believability) of weight loss advertisements, thereby increasing the odds of individuals experiencing body dissatisfaction and purchasing such products.

Given the preceding, the purpose of this study was to explore the effects of athlete endorsement on believability of weight loss advertisements targeted at men, using both plausible and unrealistic advertising claims. We hypothesized mean differences between celebrity and non-celebrity endorsers across all three dimensions of endorser credibility: attractiveness (H1a), trustworthiness (H1b), and expertise (H1c), such that the celebrity will be seen as more credible (across each dimension) than the non-celebrity. We further hypothesized mean differences, such that the celebrity would be more effective than the non-celebrity and that plausible claims would be more generally effective than Red Flag Claims, with respect to ad believability (H2), perceived program fit (H3), attitudes toward the brand (H4), and purchase intentions (H5) for weight loss products.

Methods

Sampling

Participants were recruited using an online tool, Amazon's MTurk, which allows

researchers to compensate individuals to complete tasks (e.g., a questionnaire) for a fee. Recruitment materials indicated the inclusion criteria (i.e., adults, men) and general purpose of the study. Participants were compensated immediately upon completing the survey and restricted to participating only one time. We restricted access to the survey to users who had completed no less than 100 prior tasks and achieved an approval rating of at least 95% (Peer et al., 2014).

Measures

Endorser Credibility

Endorser credibility was measured using the three-dimensional scale developed by Ohanian (1990). In total, there are 15 scale items, with five items related to each dimension of endorser credibility (i.e., attractiveness, trustworthiness, and expertise). For example, a single item related to trustworthiness used the stem, "the endorser in this advertisement is…" and was anchored from 1 (*Not at all trustworthy*) to 7 (*Completely trustworthy*).

Advertisement Believability

We measured advertisement believability using the scale items created by Beltramini and Evans (1985). A sample item from the scale, which was adapted to this context, was "this weight loss advertisement was…" This item was anchored from 1 (*Unbelievable*) to 7 (*Believable*). Program fit was measured using three items developed by Cunningham and Woods (2011) which are anchored from 1 (*Strongly* disagree) to 7 (*Strongly* agree), slightly modified to reflect the program. For example, one item was, "the goals of this program seem appropriate."

Attitudes toward the Brand and Purchase Intentions

Attitudes toward the brand and intention to purchase the product were assessed using scales proposed by Spears and Singh (2004). For attitudes toward the brand, participants were asked to rate the organization on a seven-point scale, with opposing terms as anchors. For example, one item offers responses from 1 (*Unappealing*) to 7 (*Appealing*). The purchase intention scale includes three items, with a similar response pattern. One sample item included the common stem, "regarding the product advertised," and was anchored from 1 (*Definitely will not buy*) to 7 (*Definitely will buy*). Internal consistency assessed using Cronbach's alpha was acceptable for all study measures and is reported in Table 1.

Procedure

We asked participants to complete a survey, in which they were randomly exposed to one of four advertisements, followed by a series of response items related to study constructs. To ensure data quality, we included a number of attention check items throughout the survey.

We employed a 2 x 2 (celebrity vs. non-celebrity endorser and plausible vs. Red Flag ad claim) experimental design to examine our hypotheses. Participants were randomly assigned to a condition, in which they were shown one of four, nearly identical weight loss advertisements. In the first condition, participants saw a real print advertisement from Weight Watchers' *Lose Like a Man* campaign, which featured a celebrity athlete endorser (Charles Barkley). The advertisement featured Barkley's image and included text reading, "The best part of Weight Watchers? I still eat the food I like." In the second condition, Barkley was replaced by a non-celebrity endorser. To control for biases, we chose a model image as close to the original as possible (i.e.,

cropping, wardrobe, physical characteristics of the model, race). Aside from the replaced image, the advertisements were identical (i.e., typeface, claims made, and verbiage).

In the third condition, participants were exposed to the advertisement featuring Barkley; however, tagline text was replaced with a Red Flag claim. In this condition, Barkley's testimony read, "With Weight Watchers, you can lose weight while eating anything you want… in MAN size portions!" Finally, the fourth condition included both the non-celebrity endorser and Red Flag claim.

Two items were included at the end of the survey to check manipulations. First, consumers were asked if they could identify the endorser. Across the entire sample, 88.1% ($n = 257$) of participants either properly (1) identified the endorser or (2) could not identify the non-celebrity endorser in the ad they viewed. Among those viewing an advertisement featuring the celebrity endorser, 91.8% ($n = 134$) identified Charles Barkley correctly. For the non-celebrity conditions, 84.3% ($n = 123$) correctly stated that they did not recognize the person featured in the advertisement. Furthermore, after reviewing the advertisement, participants were asked to recall the testimonial claim. Again, most participants were able to recall the stated ad claim (91.4%). Therefore, we were confident in the effectiveness of the manipulations.

Results

Participants

Study participants included 292 men who lived in the U.S. at the time of completion. The sample was predominantly white ($n = 165$, 56.5%), followed by Asian or Pacific Islanders ($n = 60$, 20.5%), Hispanic/ Latino ($n = 29$, 10.0%), African American ($n = 25$, 8.6%), Native American or Alaskan Natives ($n = 3$, 1.0%), and those listing other ($n = 10$, 3.4%). Most participants had completed an undergraduate degree ($n = 161$, 55.1%); however, some reported having finished a graduate degree ($n = 71$, 24.3%), some college ($n = 31$, 10.6%), had a high school diploma ($n = 25$, 8.6%), or did not graduate high school ($n = 4$, 1.4%). The mean age of

Table 1
Descriptive Statistics and Bivariate Correlations

Name	M	SD	α	Correlations						
				1	2	3	4	5	6	7
1. Attractiveness	4.80	1.29	.91	--						
2. Trustworthiness	5.36	1.19	.94	.51**	--					
3. Expertise	5.06	1.34	.95	.53**	.68**	--				
4. Ad Believability	4.75	1.41	.97	.51**	.59**	.69**	--			
5. Program Fit	5.54	.94	.75	.42**	.56**	.56**	.74**	--		
6. Brand Attitudes	5.13	1.39	.96	.50**	.56**	.64**	.83**	.79**	--	
7. Purchase Intentions	3.87	1.94	.97	.53**	.42**	.59**	.73**	.62**	.74**	--

Note.
** $p < .01$

respondents was 37.3 ($SD = 9.19$) years. The average body mass index (BMI) was 25.7 ($SD = 4.56$), with 11 individuals classified as underweight (3.77%), 116 as normal weight (39.7%), 114 as overweight (39.0%), and 47 as obese (16.1%), according to U.S. Centers for Disease Control and Prevention (CDC) standards.

Hypothesis Testing

Group differences across the dependent variables were tested using multiple analysis of variance (MANOVA) with Tukey's HSD *post hoc* comparisons. Our first set of analyses examined differences in perceived credibility of the endorser between celebrity/non-celebrity endorsers and ads featuring plausible/Red Flag claims (Table

Table 2

MANOVA Results for Endorser Credibility Dimensions

Dependent Variable	Condition	Condition	Mean difference	Std. Error	p
Endorser Attractiveness	1	2	-.267	.220	.620
		3	-.422	.216	.209
		4	-.210	.213	.757
	2	3	-.155	.215	.890
		4	.057	.211	.993
	3	4	.212	.207	.737
Endorser Trustworthiness	1	2	.394	.202	.208
		3	.038	.198	.997
		4	.429	.195	.124
	2	3	-.356	.197	.272
		4	.036	.194	.998
	3	4	.391	.190	.168
Endorser Expertise	1	2	.976	.219	< .001*
		3	.130	.215	.930
		4	.701	.212	.006*
	2	3	-.845	.214	< .001*
		4	-.274	.211	.561
	3	4	.571	.206	.030*

Note.
* $p < .05$; Conditions: 1 = Celebrity Athlete Endorser/Plausible Claim, 2 = Non-celebrity Endorser/Plausible Claim, 3 = Celebrity Athlete Endorser/Red Flag Claim, 4 = Non-celebrity Endorser/Red Flag Claim

2). We hypothesized the celebrity endorser would be seen as more credible across each of the three dimensions (i.e., attractiveness [H1a], trustworthiness [H1b], and expertise [H1c]). We further suspected that the Red Flag claims would be generally less believable. We found no statistically significant difference with respect to endorser attractiveness ($F =1.38, p = .248^{NS}$). The overall model for celebrity athlete endorser trustworthiness suggested potential differences between conditions, ($F =2.83, p = .039,*$ partial $\eta^2 = .03$). However, *post hoc* analyses revealed no significant differences in trustworthiness between conditions. Lastly, we observed significant differences in perceived expertise ($F = 9.27, p < .001,*$ partial $\eta^2 = .09$) between conditions. Review of *post hoc* analyses suggested that the celebrity endorser was seen as more expert than the non-celebrity, regardless of the advertisement claim (i.e., both Barkley conditions had significantly higher expertise scores than either non-celebrity ad).

We next examined differences in ad believability (H2) for the four conditions. Overall, there were significant differences between the conditions ($F = 8.17, p < .001,*$ partial $\eta^2 = .08$). The *post hoc* tests suggested that generally, the celebrity endorser improved believability, as Conditions 1 and 3 (both Barkley conditions) had the highest overall believability scores, which were not significantly different from each other.

Table 3

MANOVA Results for Ad Believability and Perceived Fit

Dependent Variable	Condition	Condition	Mean difference	Std. Error	*p*
Ad Believability	1	2	.699	.233	.015*
		3	.434	.228	.229
		4	1.078	.225	< .001*
	2	3	-.265	.227	.648
		4	.379	.224	.328
	3	4	.644	.219	.018*
Perceived Fit	1	2	.426	.156	.035*
		3	.245	.153	.360
		4	.593	.150	.001*
	2	3	-.177	.152	.652
		4	.167	.149	.679
	3	4	.345	.146	.087

Note.
* $p < .05$; Conditions: 1 = Celebrity Athlete Endorser/Plausible Claim, 2 = Non-celebrity Endorser/Plausible Claim, 3 = Celebrity Athlete Endorser/Red Flag Claim, 4 = Non-celebrity Endorser/Red Flag Claim

However, the endorser condition featuring Red Flag claims (3) was not significantly more believable than the non-celebrity condition with plausible claims (2), but was significantly more believable than the non-celebrity, Red Flag condition (4). The non-celebrity, Red Flag condition (4) had the lowest overall believability score. This condition was significantly less believable than both celebrity conditions (1 and 3), but not statistically significantly different from the non-celebrity, plausible condition (2).

We next tested for mean differences in perceived program fit (H3) across the four conditions. Again, we found significant differences between the conditions ($F = 5.65$, $p = .001$,* partial $\eta^2 = .06$), which warranted further examination. A similar trend in group differences occurred, whereby the athlete endorser conditions were the most effective overall conditions (i.e., highest perceived fit). Here, the endorser condition with plausible claims (1) performed significantly better than both non-celebrity conditions (2 and 4). The celebrity condition with Red Flag claims (3) was not significantly different from the plausible celebrity (1) or non-celebrity conditions (2 and 4). Table 3 shows the full results of *post hoc* testing for ad believability and program fit.

Table 4
MANOVA Results for Attitudes toward the Brand and Purchase Intentions

Dependent Variable	Condition	Condition	Mean difference	Std. Error	*p*
Attitudes toward the Brand	1	2	.582	.146	.087
		3	.322	.233	.063
		4	.741	.228	.493
	2	3	-.260	.233	.063
		4	.159	.227	.661
	3	4	.420	.217	.661
Purchase Intentions	1	2	.888	.327	.218
		3	.037	.320	.035*
		4	.652	.314	.999
	2	3	-.851	.318	.035*
		4	-.236	.313	.040*
	3	4	.615	.305	.040*

Note.
* *p* < .05; Conditions: 1 = Celebrity Athlete Endorser/Plausible Claim, 2 = Non-celebrity Endorser/Plausible Claim, 3 = Celebrity Athlete Endorser/Red Flag Claim, 4 = Non-celebrity Endorser/Red Flag Claim

To test our next hypothesis (H4), we examined differences in attitudes toward the brand (i.e., Weight Watchers) across the ad conditions. Again, the omnibus test for differences between groups was significant ($F = 4.11$, $p = .007$,* partial $\eta^2 = .04$). Here we observed similar, but more overlapping, results as with other variables. Again, the athlete endorser with plausible claims (1) outperformed the non-celebrity with Red Flag claims (4), which represented the extremes in brand attitudes. Here, the athlete endorser with Red Flag claims (3) and plausible non-celebrity (2) sat between the extremes and were not significantly different from any other groups.

Finally, we examined group differences in purchase intentions (H5), where we again observed significant group differences ($F = 3.87$, $p = .010$,* partial $\eta^2 = .04$). As with other variables, the highest overall score related to purchase intentions was found in the plausible, celebrity condition (1). Interestingly, the lowest overall score in purchase intentions was found in the plausible, non-celebrity condition (2) which performed significantly poorer than both celebrity athlete conditions (1 and 3). Again, there were overlapping results, such as the non-celebrity Red Flag condition (4) was not significantly different from other groups. Table 4 shows the results of *post hoc* testing for attitudes toward the brand (H4) and purchase intentions (H5).

Discussion

Given the complex interplay of body weight, celebrity, and mass media marketing (Verriet, 2020), we designed this study to improve understanding of the relative benefit of endorsement and truthfulness of claims in weight loss advertising. In our study, the ad featuring a celebrity athlete endorser had the highest overall scores across each variable tested. That is, the athlete was seen as having more expertise (and thus, more credibility) than a non-celebrity, and ads featuring the celebrity had higher scores in believability, perceptions of fit to the program, attitudes toward the brand, and purchase intentions. However, the addition of varied marketing messages complicated this general relationship. Given that false (i.e., 'Red Flag') messages are common in weight loss advertising, we tested these differences with both plausible and obviously false advertising claims. When also including the message of the advertisement, the celebrity athlete endorser paired with false ad claims was often as effective as a non-celebrity with plausible claims.

Through our first set of analyses, we found the celebrity athlete endorser was seen as having more expertise than the non-athlete endorser, when delivering the same weight-loss related message. Interestingly, there were no significant differences in participants' perceptions of the endorsers' attractiveness or trustworthiness. With respect to the attractiveness dimension, we suspect this can be explained by the similar physical features between the celebrity athlete endorser and the non-athlete endorser. Given that we intentionally chose endorsers with similar skin tone, features, styling, and facial expression, this is not necessarily surprising. Despite this finding, the observed group differences in perceived expertise were such that, even when paired with Red Flag claims, the celebrity athlete endorser was rated higher than the non-celebrity endorser in either condition. Therefore, overall, we found the celebrity endorser was seen as more credible than the non-celebrity. This is important given the enhanced brand association celebrity athlete endorsers give products and services, (Braunstein-Minkove et al., 2011; Spry et al., 2011) particularly with health-related messaging.(Verriet, 2020)

This difference in perceived expertise is particularly important, given our later findings. Among our next three hypotheses, we sought to examine differences by ad condition in overall believability (H2), program fit (H3), and attitudes toward the brand (H4), respectively. Among these variables, a similar trend appeared, whereby the celebrity athlete, making plausible claims, was more effective than a non-celebrity making Red Flag (i.e., obviously false) claims. However, across each variable, celebrity status and claim plausibility offered a sort of middle ground of effectiveness. Across all three variables, the celebrity making false claims and the non-celebrity making plausible claims (conditions 3 and 2) were not significantly different. That is, the celebrity status of the athlete overcame the reduced believability associated with Red Flag claims. Thus, the presence of the celebrity endorser was a primary driver of advertisement effectiveness. This finding is consistent with prior work on source credibility, suggesting that consumers derive some level of trust in the advertisement from their belief in the endorser's expertise.(Bush et al., 2004; Grewal et al., 1997). This suggests responsibility of celebrity endorsers for making false advertisements more likely to harm consumers, who otherwise may dismiss such advertisements.

In our final analysis, related to purchase intentions, an interesting shift in this pattern occurred. As with other variables, the celebrity endorser conditions remained the most effective with respect to purchase intentions. However, in this case, the lowest performing advertisement featured the non-celebrity endorser making *plausible* claims. Although counterintuitive, this finding suggests the complexity of advertising in the weight loss space. Prior studies suggest that weight loss advertising is particularly effective when it draws on emotional responses, consumer identification, and narrative techniques, rather than factual information (Pickett & Brison, 2019). That is, effective weight loss advertising is aspirational in nature, in this case, suggesting the client may be more like a celebrity endorser or is likely to experience unrealistic weight loss. Whereas a full discussion of the role of social stigma and body image are beyond the scope of this paper, our findings suggest a complex set of consumption patterns in the weight loss industry. Within our sample, those who are most likely to purchase weight loss products, seemed to prefer ads suggesting dramatic results (i.e., featuring a celebrity, making larger claims), even if they were less believable.

Implications for Health Behavior Research

Given the health risks of false advertising claims made in weight loss advertising, the practical implications of this work are particularly important for consumers. Individuals should be aware of the cognitive effects of endorsers in advertisements and actively evaluate claims prior to purchasing products. Historically, weight loss products and advertisements have been particularly untruthful, as evidenced by the many FTC efforts and campaigns to rein them in. Such ads prey on body image concerns of consumers to increase product sales (Pickett & Brison, 2019). Such falsehoods are not benign, as the lack of regulation in the weight loss industry has allowed many weight loss products that include banned, discouraged-use, and/or adulterated substances to come onto the market (Dastjerdi et al., 2018; Eichner et al., 2016; Khazan et al., 2014). According to our findings, the addition of celebrity athlete endorsers to ads only makes advertising claims more believable to potential users. Thus, individuals should remain vigilant of strategies used to influence purchase behaviors of weight loss products

with unverified health and safety claims. Furthermore, regulators should remain vigilant in their efforts to reduce deceptive advertising practices for potentially harmful weight loss products.

Our findings advance understanding of liability related to false advertising in weight loss advertising, specifically those featuring celebrity athlete endorsers (Braunstein-Minkove et al., 2011; Pickett & Brison, 2019). Our study provides empirical evidence of the potential harm to consumers based on the added presence of these endorsers, who lend credibility to misleading health claims. In particular, our results illustrate the power of a celebrity athlete endorser to improve consumers' confidence in an advertisement's believability, thereby increasing purchase intentions. Additionally, our results reinforce findings that male athlete endorsers are particularly effective in health-related advertisements targeting men (Gowen, 2012). Our results are important for understanding the complex nature of weight loss behaviors. Our results suggest traditional predictors of purchase behaviors (e.g., believability, perceived fit, and brand attitudes) may be less predictive in the weight loss space, as likely, actual consumers of the product often seek dramatic (i.e., implausible) results. This is an important finding, given the documented relationships between body dissatisfaction and risky health behaviors (e.g., disordered eating), as well as poorer mental and physical health (Gillen, 2015; Griffiths et al., 2016). This study suggests the importance of increased regulation of weight loss advertising, as certain marketing practices are demonstrably effective in driving purchase and use of products with unverified health claims and potentially dangerous effects.

Limitations and Future Directions

As with any study, ours is not without some limitations. First, we used only one product, Weight Watchers, and compared one male celebrity athlete endorser to a similarly looking non-athlete endorser. Given this is a real national brand and advertisement, participants' preconceptions about this brand and advertising message may have affected our findings. Similarly, participants' personal feelings about the endorser (Charles Barkley) also may influence overall findings. Future work should explore differences in credibility for different endorsers and products. Second, whereas we purposefully targeted a male sample, doing so limits the generalizability of our findings. Future work may seek to explore gendered effects of celebrity endorsers in weight loss advertising.

Conclusion

Here we aimed to explore effects of celebrity athlete endorsement on believability of weight loss advertisements. Our results indicated the presence of a celebrity athlete endorser contributed significantly to advertisement believability. Indeed, a celebrity athlete endorser was seen as more expert than a non-celebrity endorser, even when making unrealistic weight loss claims. Given the frequency of false and exaggerated claims in weight loss advertising, as well as the documented dangers of many such supplements and products, these results suggest a particular risk for potential consumers. As such, individuals should remain vigilant, as misleading weight loss advertisements can lead to significant health-related damages. Additionally, regulators should continue to monitor advertising messages in weight loss advertisements, as false claims made by endorsers (i.e., exaggerations) increased believability of ads and increased potential

for material harm. When used responsibly, certain weight loss products can be effective and improve participant health. However, our results point to difficulty for individuals seeking to identify safe, evidence-based weight management solutions, as deceptive and misleading advertising practices (e.g., celebrity endorsement) were effective tactics for promoting products making unrealistic weight loss claims.

Discussion Questions

Our findings suggest that the presence of a celebrity endorser increased consumers' belief of claims made in weight loss advertisements, even when those claims were blatantly implausible. What are potential policies to reduce the use of false or misleading practices in the weight loss category?

Our study points to the influence of advertising practices on individuals' consumption patterns of health-related products. What interventions or strategies could be developed to: (1) improve individuals' awareness of these marketing influences; and (2) encourage adherence to more sustainable, evidence-based health behavior strategies?

Ethical Approval Statement

Study procedures were approved by institutional review board prior to data collection. Participants provided informed consent to take part in the study.

Potential Author Conflicts

The authors have no conflicts of interest to declare.

References

Avery, D. R. (2011). Support for diversity in organizations: A theoretical exploration of its origins and offshoots. *Organizational Psychology Review*, *1*(3), 239-256. https://doi.org/10.1177/2041386611402115

Barnes, M., Abhyankar, P., Dimova, E., & Best, C. (2020). Associations between body dissatisfaction and self-reported anxiety and depression in otherwise healthy men: A systematic review and meta-analysis. *PLoS One*, *15*(2), e0229268. https://doi.org/10.1371/journal.pone.0229268

Bell, H. S., Donovan, C. L., & Ramme, R. (2016). Is athletic really ideal? An examination of the mediating role of body dissatisfaction in predicting disordered eating and compulsive exercise. *Eating Behaviors*, *21*, 24-29. https://doi.org/10.1016/j.eatbeh.2015.12.012

Beltramini, R. F., & Evans, K. R. (1985). Perceived believability of research results: Information in advertising. *Journal of Advertising*, *14*(3), 18-31. https://doi.org/10.1080/00913367.1985.10672953

Boyd, T. C., & Shank, M. D. (2004). Athletes as product endorsers: The effect of gender and product relatedness. *Sport Marketing Quarterly*, *12*(2), 82-93.

Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image*, *17*, 117-131. https://doi.org/10.1016/j.bodyim.2016.03.003

Braunstein-Minkove, J. R., Zhang, J. J., & Trail, G. T. (2011). Athlete endorser

effectiveness: Model development and analysis. *Sport, Business and Management*, *1*(1), 93-114. https://doi.org/10.1108/20426781111107199

Brechan, I., & Kvalem, I. L. (2015). Relationship between body dissatisfaction and disordered eating: Mediating role of self-esteem and depression. *Eating Behaviors*, *17*, 49-58. https://doi.org/10.1016/j.eatbeh.2014.12.008

Brison, N. T., Baker, T. A. I., & Byon, K. K. (2013). Tweets and crumpets: Examining U.K. and U.S. regulation of athlete endorsements and social media marketing. *Journal of Legal Aspects of Sport*, *23*, 55.

Brison, N. T., Baker, T. A. I., Byon, K. K., & Evans, N. J. (2020). An interdisciplinary examination of the material effects of deceptive sport beverage advertisements. *Journal of Global Sport Management*, https://doi.org/10.1080/24704067.2020.1711531

Brison, N. T., Pickett, A. C., & Brown, K. (2020). Losing weight with Charles and Dan: Examining potential liability for endorser claims in weight loss advertisements. *Sport Marketing Quarterly*, *29*(2). https://doi.org/10.32731/SMQ.292.062020.05

Brown, Z., & Tiggemann, M. (2016). Attractive celebrity and peer images on Instagram: Effect on women's mood and body image. *Body Image*, *19*, 37-43. https://doi.org/10.1016/j.bodyim.2016.08.007

Bush, A. J., Martin, C. A., & Bush, V. D. (2004). Sports celebrity influence on the behavioral intentions of Generation Y. *Journal of Advertising Research*, *44*(1), 108-118. https://doi.org/10.1017/S0021849904040206

Chi, H., Yeh, H. R., & Huang, M. W. (2009). The influences of perceived value on consumer purchase intention: The moderating effect of advertising endorser. *Journal of Global Business Management*, *5*(1), 224-233.

Cunningham, G. B., & Woods, J. (2011). For the health of it: Advertisement message and attraction to fitness clubs. *American Journal of Health Studies*, *26*(1), 4-9.

Dastjerdi, A. G., Akhgari, M., Kamali, A., & Mousavi, Z. (2018). Principal component analysis of synthetic adulterants in herbal supplements advertised as weight loss drugs. *Complementary Therapies in Clinical Practice*, *31*, 236-241. https://doi.org/10.1016/j.ctcp.2018.03.007

Eichner, S., Maguire, M., Shea, L. A., & Fete, M. G. (2016). Banned and discouraged-use ingredients found in weight loss supplements. *Journal of the American Pharmacists Association*, *56*(5), 538-543. https://doi.org/10.1016/j.japh.2016.03.013

Erdogan, B. Z. (1999). Celebrity endorsement: A literature review. *Journal of Marketing Management*, *15*(4), 291-314. https://doi.org/10.1362/026725799784870379

Gillen, M. M. (2015). Associations between positive body image and indicators of men's and women's mental and physical health. *Body Image*, *13*, 67-74. https://doi.org/10.1016/j.bodyim.2015.01.002

Gonçalves, L., Zanlorenci, S., Borges, L. L., de Lima, T. R., & Silva, D. A. S. (2022). Body weight dissatisfaction and health risk behaviors in adolescents. *Perceptual and Motor Skills*, 00315125221137678. https://doi.org/10.1177/00315125221137678

Gowen, G. (2012, May 11). *Gaining, Losing Weight Means Big Paydays for Celebs - ABC News*. *ABC News*. http://abcnews.go.com/Entertainment/gaining-losing-weight-means-big-paydays-celebs/story?id=16314049

Grewal, D., Kavanoor, S., Fern, E. F., Costley, C., & Barnes, J. (1997). Comparative versus noncomparative advertising: A meta-analysis. *Journal of Marketing*, *61*(4), 1-15. https://doi.org/10.1177/002224299706100401

Griffiths, S., Hay, P., Mitchison, D., Mond, J. M., McLean, S. A., Rodgers, B., Massey, R., & Paxton, S. J. (2016). Sex differences in the relationships between body dissatisfaction, quality of life and psychological distress. *Australian and New Zealand Journal of Public Health*, *40*(6), 518-522. https://doi.org/10.1111/1753-6405.12538

Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women, and children* (4th ed.). Routledge. https://doi.org/10.4324/9781003100041

Hill, C. (2015, December 24). 10 things the weight-loss industry won't tell you. *Market Watch*. http://www.marketwatch.com/story/10-things-the-weight-loss-industry-wont-tell-you-2014-01-10?page=10

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, *17*, 100-110. https://doi.org/10.1016/j.bodyim.2016.02.008

Hsu, C., & McDonald, D. (2002). An examination on multiple celebrity endorsers in advertising. *Journal of Product & Brand Management*, *11*(1), 19-29. https://doi.org/10.1108/10610420210419522

Khazan, M., Hedayati, M., Kobarfard, F., Askari, S., & Azizi, F. (2014). Identification and determination of synthetic pharmaceuticals as adulterants in eight common herbal weight loss supplements. *Iranian Red Crescent Medical Journal*, *16*(3), e15344. https://doi.org/10.5812/ircmj.15344

Kong, P., & Harris, L. M. (2015). The sporting body: Body image and eating disorder symptomatology among female athletes from leanness focused and nonleanness focused sports. *Journal of Psychology*, *149*(2), 141-160. https://doi.org/10.1080/00223980.2013.846291

McCarthy, R. E., Bowen, D. G., Strasser, S. I., & McKenzie, C. (2021). The dangers of herbal weight loss supplements: A case report of drug-induced liver injury

secondary to Garcinia cambogia ingestion. *Pathology*, *53*(4), 545-547. https://doi.org/10.1016/j.pathol.2020.08.021

Montgomery Sklar, E. (2017). Body image, weight, and self-concept in men. *American Journal of Lifestyle Medicine*, *11*(3), 252-258. https://doi.org/10.1177/1559827615594351

Ohanian, R. (1990). Construction and validation of a scale to measure celebrity endorsers' perceived expertise, Trustworthiness, and attractiveness. *Journal of Advertising*, *19*(3), 39-52. https://doi.org/10.1080/00913367.1990.10673191

Pearl, R. L., & Puhl, R. M. (2018). Weight bias internalization and health: A systematic review. *Obesity Reviews*, *19*(8), 1141-1163. https://doi.org/10.1111/obr.12701

Peer, E., Vosgerau, J., & Acquisti, A. (2014). Reputation as a sufficient condition for data quality on Amazon Mechanical Turk. *Behavior Research Methods*, *46*(4), 1023-1031. https://doi.org/10.3758/s13428-013-0434-y

Pickett, A. C., & Brison, N. T. (2019). Lose like a man: Body image and celebrity endorsement effects of weight loss product purchase intentions. *International Journal of Advertising*, *38*(8), 1098-1115. https://doi.org/10.1080/02650487.2019.1586208

Rothblum, E. D. (2018). Slim chance for permanent weight loss. *Archives of*

Scientific Psychology, *6*(1), 63. https://doi.org/10.1037/arc0000043

Rounsefell, K., Gibson, S., McLean, S., Blair, M., Molenaar, A., Brennan, L., Truby, H., & McCaffrey, T. A. (2020). Social media, body image and food choices in healthy young adults: A mixed methods systematic review. *Nutrition & Dietetics*, *77*(1), 19-40. https://doi.org/10.1111/1747-0080.12581

Sardina, J. (1999). Misconceptions and misleading information prevail - less regulation does not mean less danger to consumers: Dangerous herbal weight loss products. *Journal of Law and Health*, *14*, 107.

Selensky, J. C., & Carels, R. A. (2021). Weight stigma and media: An examination of the effect of advertising campaigns on weight bias, internalized weight bias, self-esteem, body image, and affect. *Body Image*, *36*, 95-106. https://doi.org/10.1016/j.bodyim.2020.10.008

Spears, N., & Singh, S. N. (2004). Measuring attitude toward the brand and purchase intentions. *Journal of Current Issues & Research in Advertising*, *26*(2), 53-66. https://doi.org/10.1080/10641734.2004.10505164

Spry, A., Pappu, R., & Bettina Cornwell, T. (2011). Celebrity endorsement, brand credibility and brand equity. *European Journal of Marketing*, *45*(6), 882-909. https://doi.org/10.1108/03090561111119958

Stankevich, A. (2017). Explaining the consumer decision-making process: Critical literature review. *Journal of*

International Business Research and Marketing, *2*(6), 7-14. https://doi.org/10.18775/jibrm.1849-8558.2015.26.3001

Tiggemann, M., & McGill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology*, *23*(1), 23-44. https://doi.org/10.1521/jscp.23.1.23.26991

Verriet, J. (2020). Representing embodied expertise: Anorexia and the celebrity athlete's lifestyle advice. *Celebrity Studies*, https://doi.org/10.1080/19392397.2020.1760908

Wilson, N. L., & Blackhurst, A. E. (1999). Food advertising and eating disorders: Marketing body dissatisfaction, the drive for thinness, and dieting in women's magazines. *Journal of Humanistic Counseling, Education and Development*, *38*(2), 111-112. https://doi.org/10.1002/j.2164-490X.1999.tb00069.x

Wu, Y.-K., & Berry, D. C. (2018). Impact of weight stigma on physiological and psychological health outcomes for overweight and obese adults: A systematic review. *Journal of Advanced Nursing*, *74*(5), 1030-1042. https://doi.org/10.1111/jan.13511