

## **Pride in Technology-Based Health Interventions: A Double-Edged Sword**

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### **ABSTRACT**

This study examines the contrasting effects (positive and negative) of hubristic pride about one’s weight, after exposure to a weight control website, on consumers’ attitudes and self-regulatory behavior. Using an experiment embedded in a survey, this study offers insights into the multifaceted consequences generated by pride, when elicited by technology-based social marketing interventions. Greater feelings of hubristic pride about one’s weight translate into positive attitudes toward the website information but reduce the perceived relevance of the information to the self. This reduced perceived relevance leads to poor perceptions of website interactivity with consequent negative effects on behavioral regulation. Thus, increasing feelings of pride can be a double-edge sword. Hubristic pride directly affects technology-based behavioral intentions, such as intentions to download a health-related mobile application, but indirectly influences nontechnology-oriented intentions to take health action through attitudes. Marketers should be cautious of the mixed attitudinal and behavioral effects of pride.

**Keywords:** Technology-based intervention; Pride, Website interactivity; Attitudes; Behavioral intentions; Mobile phone application; Weight control.

Social marketers use technological platforms (e.g., websites, mobile phones, social media) for various behavioral change initiatives (e.g., Uhrig, Bann, Williams, & Evans, 2010; Walton & Hume, 2011), including health-related ones (e.g., Ahadzadeh, Sharif, Ong, & Khong, 2015; Shaw et al., 2013). Technology allows disseminating information quickly by leveraging the networks of target audiences and by enabling the personalization and reinforcement of social marketing messages through greater interactivity (Lee & Kotler, 2011). Moreover, technological platforms reach consumers “when and where they are most likely to be open to communications and behavior change” (Lefebvre, 2009, p. 493). Consumers use technological devices to “obtain useful benefits, [and] also to enjoy the experience of using them” (Kulviwat et al., 2007, p. 1060). Social marketers capitalize on this positive hedonic experience to promote behavioral change, as interactivity facilitates persuasion (Coyle & Thorson, 2001; Fortin & Dholakia, 2005).

Prior research has focused on the general effectiveness of technology-based platforms in social marketing (e.g. Cullen, Thompson, Boushey, Konzelmann, & Chen, 2013; Han et al., 2008) or on the design and implementation of technology-based interventions (e.g., Young, Harrell, Jaganath, Cohen, & Shoptaw, 2012). This research, however, concentrates on cognitive processes and largely overlooks emotions, whether as consequences of the interaction with technological platforms or as predictors of attitudes and behaviors (Kulviwat et al., 2007). Research in social marketing often investigates both positive and negative emotions (Lee, 2010) because, under certain circumstances, these influence consumers’ behavioral change processes (Antonetti & Baines, 2015; Manika & Gregory-Smith, 2014; Pham, Geuens, & De Pelsmacker, 2013). However, social marketing scholars have not yet theoretically or empirically examined the positive emotional responses arising from hedonic experiences associated with technology-based platforms and, in turn, how these may affect attitudes and behavioral change.

The interactive marketing and information systems literatures, however, already offer studies examining emotions related to technology acceptance, the hedonic experience of using technology, and intentions to use technology. Theories such as the Technology Acceptance Model (TAM; e.g. Kulviwat et al., 2007), the Diffusion of Innovations Theory (DOI; Wood & Moreau, 2006), and the Theory of Planned Behavior (TPB; de Guinea, Ortiz, & Zynne, 2009), have been used to explain these relationships. A range of emotion-related concepts have been investigated as drivers of the adoption and usage of technology (Beaudry & Pinsonneault, 2010), such as positive versus negative affect (Venkatesh, 2000); enjoyment and anxiety (Van der Heijden, 2004); pleasure, arousal, and dominance (PAD model; Kulviwat et al., 2007). Studies have also examined affect in relation to the design and visual elements of technological interfaces (e.g. Adam, Astor, & Kramer, 2016). However, across interactive marketing, information systems, and social marketing literatures little is known about the role of pride, as a positive emotional response resulting from exposure to a technology-based social marketing intervention, and its self-regulation mechanisms on consumers’ attitudes and intentions. Although evidence shows that pride can help consumers resist temptation and achieve important personal goals (Hofmann & Fisher, 2012; Patrick et al., 2009), research also indicates that this effect can backfire and that pride can sometimes hinder self-regulatory efforts (Salerno, Laran, & Janiszewski, 2015; Wilcox, Kramer, & Sen, 2011).

As the interaction between humans and technology continues to rise, social marketing technology-based interventions should be examined as methods for countering obesity (Lowe, Fraser, & Souza-Monteiro, 2015). Many studies have been conducted on the efficacy of technology-based weight control interventions (e.g. Burke et al., 2012; Unick, Kent, & Wing, 2015) and positive emotions were found to be integral to weight loss and maintenance (Elfhag &

Rossner, 2005). Even though Baek & Yu (2009, p.27) note that “an expression of self-reward/praise for weight loss (e.g., ‘Feel pride in yourself’), is a common strategy for weight loss Internet programs/websites, there is an absence of literature on the positive and negative ramifications of pride, relative to consumer feelings about weight, after exposure to a technology-based weight-control website. Thus, this study addresses a common research gap across social marketing, health, interactive marketing and information systems literatures by examining the mixed effects hubristic pride can have on consumers’ attitudes and self-regulatory behavior.

The literature on pride (e.g. Castonguay et al., 2012; Tracy & Prehn, 2012) has documented that feelings of pride can be differentiated in terms of their relative focus on prestige or goal progress, which is reflected in the conceptualizations of hubristic and authentic pride, respectively. This differentiation is relevant to the promotion of self-regulatory behavior (Salerno et al., 2015). Simply being exposed to weight control information on a website is unlikely to cause consumers to believe they have improved their weight control management (i.e., authentic pride). Individuals may, however, experience hubristic pride after exposure to a weight control website as a sense of already complying with some of the recommendations on the website or from the perception of already having a healthy weight.

Thus, the current research (1) examines the positive and negative consequences of consumers’ feelings of hubristic pride on self-regulatory behavior<sup>1</sup>, and (2) tests how this emotion, experienced as a result of exposure to the technology-based weight control intervention, may direct consumer choice of a technology-oriented weight control behavior versus a nontechnology-oriented behavior. To achieve these aims, a real weight control website is used as

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<sup>1</sup> This study conceives weight control as a form of self-regulatory behavior.

a technology-based health intervention to address limitations associated with laboratory experiments, such as artificiality and lack of generalizability (see Levitt & List, 2007 and Schram, 2005). Researchers’ argue that non-laboratory experiments are highly relevant for policymakers (Morton & Williams, 2009). Moreover, field experiments are considered to speak to both theorists and policymakers (List, 2007); thus they have both a knowledge-generating contribution and a real-world impact.

The following section reviews prior literature on technology-based social marketing interventions and weight control (including a section on the used weight control website), as well as the literature on emotions (particularly pride), attitudes, and self-regulatory behavior. Then, several hypotheses are proposed, followed by the methodology and results. The article concludes with a discussion of the implications, limitations, and future research directions.

## **LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **Social Marketing and Technology-Based Weight Control Interventions**

Prior social marketing research has examined the use of the Internet as a social marketing tool to encourage particular types of behavioral change (e.g., water conservation, Walton & Hume, 2011; participation in census, Andreasen, 2002), and to disseminate information about social marketing interventions (Uhrig et al., 2010). Health-related social marketing research focused on examining the influence of perceived health risk and consciousness on health-related Internet usage (Ahadzadeh et al., 2015) and the role of social media in health communications (Thackeray, Neiger, & Keller, 2012). Overall, prior research focuses on the effectiveness of such campaigns (Cullen et al., 2013; Matano et al., 2000; Papadaki & Scott, 2006) or the critical challenges for successful implementation in different contexts (Young et al., 2012). Cugelman, Thelwall, and Dawes’s (2011) meta-analysis of online health-related social marketing

interventions shows most eHealth interventions had an overall small but nonetheless significant impact on health behavior. This indicates such interventions can motivate voluntary change (Ahadzadeh et al., 2015; Shaw et al., 2013). Research has also examined weight loss and obesity.

Weight control interventions via Internet-based technologies (e.g., websites, mobile phone applications), reduce the burden of traditional and time-consuming interventions, increase self-monitoring, and provide immediate tailored feedback that increases adherence to weight control advice (e.g. Burke et al., 2012; Unick et al., 2015; Petersen, Sill, Lu, Young, & Edington, 2008). Multiple studies have examined various Internet-based weight control interventions and note their differences. Tate et al. (2001) noted structured weight loss programs delivered via the Internet and email would be more effective than links to educational websites, while Shaw et al.’s (2013) found that weight control text messages are successful if delivered at least once a day, with both promotion and prevention framing having a positive effect on weight loss over a three-month period. Internet weight loss programs may also appeal to different consumer segments (Unick et al., 2015). Petersen, Sill, Lu, Young, and Edington’s (2008) study showed such interventions can improve employees’ eating habits, leading to weight loss. Unick et al. (2015) also recently point out technology-based interventions can also be used to identify individuals who may “fail to achieve clinically significant weight loss” (Unick et al., 2015, p.1560) and thus may require subsequent interventions.

While, technology-based interventions appear beneficial to weight control behavior change strategies, systematic reviews of web-based weight loss interventions (e.g., Arem & Irwin, 2011; Neve, Morgan, Jones, & Collins, 2010) propose inconclusive results for body weight loss. Neve et al. (2010) attribute this to prior studies’ small sample sizes and the heterogeneity of the interventions design and measured outcomes. Therefore, additional research

on the interaction between technology and weight control activities is needed (Lowe et al., 2015).

In addition, most weight control Internet-based studies focused on cognitive variables and overlooked emotions. Elfhag and Rossner (2005) note how emotions play a vital role in weight loss and weight maintenance. However, research has “only begun to explore the relationship between pride and health promoting behaviours such as physical activity” (see Mack, Kouali, Gilchrist, & Sabiston, 2015, p. 1050), and few, if any, studies examined how pride evoked by exposure to a technology-based health intervention can influence consumers’ cognitive processes. The current study addresses this research gap by investigating the positive and negative ramifications that feelings of pride, about one’s weight after exposure to a weight control website, can have on consumers’ attitudes and self-regulatory behavior.

Among the limited literature on pride and health, Troop’s (2016) research examined the effects of shame and pride, and found that people who are ashamed of their bodies are more likely to consume less calories in the next 7 days. Alternatively, Goss and Allan (2009) argue that pride could have an important role in the onset and maintenance of some eating disorders. Restriction of food and other impulses are often associated with self-esteem and pride in the self (Goss and Allan, 2009). Pride in appearance seems to facilitate weight maintenance (DePue et al., 1995) and fitness-related pride increases engagement with physical activity (Mack et al., 2015).

Related to this, Teixeira et al.’s (2012) systematic review found that intrinsic motivation (e.g. feelings of enjoyment for an activity) is more predictive of long-term exercise adherence, than extrinsic motivation to achieve outcomes separately to an activity. Therefore, enjoyment of an activity can have positive effects on weight control behavior. Moreover, social network sites allowing the interaction of people with common interests, appear to increase self-esteem and desires of helping others loose weight, which is beneficial for self-monitoring and adherence

(Merchant, 2015). Thus, the hedonic experience of using technological interventions could help motivate weight control behavior and adherence to advice by facilitating persuasion (Coyle & Thorson, 2001; Fortin & Dholakia, 2005), through increasing pride in consumers’ weight. This is why emotional self-reward (i.e., ‘Feel pride in yourself’), is a common strategy for weight loss Internet programs and websites (Baek & Yu, 2009).

Despite this, the effects of pride evoked by a website have not been previously investigated. To fill this gap we examine feelings of pride elicited by exposure to a real technology-based health intervention: the United Kingdom’s National Health Service (NHS) weight control website.

### **The United Kingdom’s National Health Service Weight Control Website**

The United Kingdom has the highest obesity percentage rate in Europe (NHS, 2014), affecting one in every four adults (NHS, 2015). This is expected to rise so that “two-thirds of women and three-quarters of men in Britain will be overweight by 2030” (Pemberton, 2015). To tackle this, the NHS has created a technology-based intervention in the form of a website that provides information on weight control, services to help in weight loss and healthy eating (Datamonitor, 2003). This includes two webpages that offer information related to weight control i.e. “Lose weight” (<http://www.nhs.uk/livewell/loseweight/Pages/Loseweighthome.aspx>); “Healthy eating” (<http://www.nhs.uk/livewell/healthy-eating/Pages/Healthyeating.aspx>).

In the UK, diet websites are very popular (Papadaki & Scott, 2005), and while there are many options, Yu, King, & Yoon (2010) note that 90% of people click on a result within the first three pages of the search engine results. The NHS webpages for weight loss and healthy eating are often among the top results on related keywords search. This NHS website received 47% of all traffic from obesity search terms in April 2014 and there were more than 50 million visits in

March 2016 on weight loss webpages (NHS 2014; 2016). Weight control is one of the most frequently visited topics on the NHS website, indicating the rising consumer trend of using technological platforms for health-related purposes and the relevance of the selected weight control intervention for the fight against obesity in the United Kingdom.

The NHS website includes a wide range of information and strategies aimed at the general public (e.g., “Develop healthier eating habits and get more active with the NHS Choices weight loss guide,” “Keep hunger at bay with these low-calorie twists on some of the nation’s favourite snacks,” and “Find a weight loss plan to suit you with our review of the most popular diets”). This information is relevant to most consumers regardless of their current weight; as individuals with both a healthy and an unhealthy body mass index (BMI) may have a poor diet and experience health problems as a result (Stewart, 2015). Yu, King, & Yoon’s (2010) content analysis of 100 dieting websites in the UK found that a “health and nutrition” appeal (positive information) was most frequently used (94%), while only a small percentage (7%) of the websites contained information about diseases (threat/negative information).

This study selected the NHS website for two reasons, aside from its popularity in the UK. First, it is a positively framed source of information, which fits the aim to examine hubristic pride evoked by a technology-based health intervention. The NHS’s website contains positive phrases (e.g., “A healthy, nutritious diet can help you look and feel your best, and is easier than you might think”) and stories of personal success (e.g., “Phil says the weight loss plan has left him feeling healthier, fitter and more confident,” “Christine says the NHS weight loss plan helped her overcome a love-hate relationship with food”), which may generate a feeling of pride among consumers exposed to the website. Baek & Yu (2009) also suggest that eliciting pride is a common strategy for weight loss Internet programs and websites in some countries. However, a

content analysis of related websites on self-reward strategies has not yet been conducted in the UK, to verify this. While perhaps not the only website using this strategy in the UK, the NHS website was chosen given our focus on hubristic pride. Second, the NHS website allows examining the influence of pride on two types of health actions (behavioral responses): downloading the BMI mobile phone application<sup>2</sup> to “get practical weight loss information” (i.e., a technology-oriented behavior) and a concrete 12-week weight control plan for consumers to use (i.e., a nontechnology-oriented behavior). The ‘BMI healthy weight calculator’ page is one of the most visited weight loss related pages with 9.8 million visits in 2016 (NHS, 2016). Thus, it is vital to understand how pride as a result of exposure to this NHS website, drives technology-oriented actions vs. non-technology oriented ones, which might be required in conjunction in the weight loss plan of some consumers (Unick et al., 2015).

### **Affect in Social Marketing**

Cognition and affect are intertwined (Storbeck and Clore, 2007). Cognitive processes are integral part of emotions and confer a specific meaning to the feelings we experience (Roseman, Wiest, and Swartz, 1994). Research shows that discrete emotions vary on the basis of specific cognitive dimensions that, once activated, have important influences on subsequent behavior (Baumeister, Vohs, DeWall, & Zhang, 2007; Frijda, 2005; Roseman et al., 1994). Consequently, emotional reactions evoked by marketing materials can influence both cognitions and behaviors (Antonetti & Baines, 2015; Baumeister et al., 2007).

On the basis of this evidence we expect that consumers’ emotional responses to a technological intervention will determine their attitudes toward the intervention (i.e., website information and interactivity). Affect can inform judgments, in a quick heuristic process in

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<sup>2</sup>Purpura, Schwanda, Williams, Stubler, & Sengers (2011) note that most behavioral weight loss programs using technology start with a BMI calculation to determine the need for change.

which feelings are used as shortcuts for evaluating objects (i.e., “How do I feel about it?”) (Forgas, 1995). Affect also influences message elaboration and processing (Lien, 2001). Research has shown that the effect of emotion on behavior is dependent on the cognitive processes active when the emotion is experienced (Han, Lerner, & Keltner, 2007), the inferences consumers make about the causes of emotions (Ivanic, 2015; Salerno et al., 2015), and consumers’ contextual knowledge of and the meanings associated with the behavior marketers are promoting (Crusius & Lange, 2015; Frijda, 2005). The current study examines pride as a discrete emotional experience (generated from exposure to the website) and its role in self-regulatory behavior (Patrick et al., 2009; Tracy & Robins, 2007) using the contextual inferential processes that shape the emotional experience and its consequences (Salerno et al., 2015).

### **Pride and Self-Regulation**

Pride is an emotion associated with positive outcomes considered valuable and relevant to self-image (Tracy & Robins, 2007). According to this definition and consistent with previous research (e.g., Patrick et al., 2009), weight control is an adequate context to assess the impact of pride on self-regulatory behavior, considering the focus of today’s society on body image and health (see Castonguay, Brunet, Ferguson, & Sabiston, 2012). However, the potential role of this emotion in self-regulation is controversial. While some psychological research suggests pride can result in effective self-regulatory behaviors (Antonetti & Maklan, 2014b; Boezeman & Ellemers, 2008; Hofmann & Fisher, 2012; Williams & DeSteno, 2008), other studies claim pride can lead to licensing and, therefore, reduce consumers’ commitment to self-regulation (Fishbach & Dhar, 2005; Salerno et al., 2015; Wilcox et al., 2011). This could be due to different appraisals of information that might be part of consumers’ emotional experiences (Salerno et al., 2015).

Scholars suggest that pride comes in two forms: authentic pride and hubristic pride (Tracy & Robins, 2007). Authentic pride arises from success in achieving a specific goal. Consequently, the emotion sends a message to the self about personal success or achievement and leads to a sense of goal progress (e.g., “I am improving my weight control practices”). Hubristic pride involves an inflated sense of self – that is, the individual feels pride in what he or she is (i.e., “I have a healthy weight”) rather than what he or she does (engage in a specific type of behavior). This form of pride is more likely to elicit identity concerns because the focus is on the person’s sense of self rather than on the progress towards a sought goal.

Both forms of pride can have positive and negative effects on regulatory behavior, depending on the circumstances (Huang et al., 2014; Salerno et al., 2015). Usually, feelings of authentic pride reinforce commitment to self-regulation and the maintenance of the target behavior (Antonetti & Maklan, 2014a; Boezeman & Ellemers, 2008). However, consumers who feel authentic pride due to having progressed toward their weight goal, might consider rewarding themselves by eating more, which reduces weight control behaviors (Salerno et al., 2015). The literature on licensing explains this potential negative side effect of perceived goal progress (Blanken, van de Ven, & Zeelenberg, 2015; Jordan, Mullen, & Murnighan, 2011) as diminished ability to self-regulate. Research on pride has also identified this effect, especially in situations in which a regulatory goal is active (Wilcox et al., 2011) and the related effort is perceived as low (Salerno et al., 2015). These two factors apply to the current context because participants in this study voluntarily decided to explore the NHS weight control information (i.e., presumably activating weight control goal) and the perusal of information on a website generally tends to be a lower effort activity than engaging in actual weight control practices (e.g., exercising). In other

words, participants could interpret their feelings of pride as an indication of their progress in weight control and this would decrease their interest in positive self-regulatory behavior.

Conversely, consumers exposed to the website might experience hubristic pride and, therefore, develop a sense of superiority to and personal distinction from others (i.e., “I have a healthier weight than most people I think are using this website”) (Tracy, Cheng, Robins, & Trzesniewski, 2009; Tracy & Prehn, 2012). This form of pride is linked to the self-concept (rather than the behavior performed). Under this scenario, consumers browsing the content could essentially feel better about themselves and their weight, as they may believe they already have the “healthy status” the NHS website is promoting. Hubristic pride is often associated with social comparisons (Shin, Park, & Moon, 2015) and a sense of prestige and social status (Ivanic, 2015). Consumers with this state of mind might have either a positive or negative reaction to the intervention, depending on whether they think the website is relevant to their perceived self-identity. Consumers might be more willing to engage in future regulatory actions because of their desire to behave consistently with their identity (Huang et al., 2014). For example, consumers with a healthy weight may be motivated to engage in weight control practices to maintain their weight (Ivanic, 2015). However, consumers might ignore information or activities they perceive not aligned with their identity (Ivanic, 2015; Tracy et al., 2009). Consequently, they might dislike the website itself because they deem it as being targeted to consumers with a different weight status (i.e., unhealthy) from their own and not consonant with their self-identity.

Both types of pride often overlap and are difficult to disentangle or measure precisely (Holbrook et al., 2014a, 2014b). Nonetheless, studies (Huang et al., 2014; Ivanic, 2015; Tracy & Prehn, 2012; Tracy & Robins, 2007) have documented that feelings of pride can be differentiated in terms of their relative focus on prestige or goal progress (i.e., hubristic vs. authentic). This

differentiation is relevant in the promotion of self-regulatory behavior (Huang et al., 2014; Salerno et al., 2015). Feelings arising from consumers’ perceptions of goal progress are unlikely to cause an increase in pride after a single exposure to a website, as investigated in this study. Simply being exposed to weight control information on a website is unlikely to cause consumers to believe they have improved their weight control management (i.e., authentic pride). Rather, consumers might feel better about themselves and experience hubristic pride after voluntary exposure to the website. Pride could arise from a sense of already complying with some of the recommendations on the website or from the perception of already having a healthy weight.

Considering the research context, consumers will be more likely experience hubristic pride regardless of their weight. Hubristic pride may arise from knowledge miscalibration (Alba & Hutchinson, 2000), or the difference between what consumers think they know about their weight (i.e., subjective knowledge; Brucks, 1985) and what they actually know (i.e., objective knowledge; Brucks, 1985), due to exposure to the website. For example, studies have shown that distortion of provided information that is inharmonious with the self or avoidance of dissonant information can lead consumers to search for consonant information to avoid experiencing negative emotions (see Gregory-Smith, Smith, & Winklhofer, 2013). When exposed to weight information, consumers are more likely to selectively pay attention to information that makes them feel good about their own condition, thus boosting hubristic pride.

Thus, this study proposes that pride has a positive self-regulatory influence motivated by (1) the need to maintain identity-consistent behavior (Huang et al., 2014; Tracy et al., 2009) and (2) the desire to experience feelings of pride again in the future (Patrick et al., 2009). This influence is driven by hubristic feelings that increase consumers’ behavioral intentions to control/manage personal weight. Thus:

**H1:** After consumers are exposed to the weight control website intervention, hubristic pride will positively and significantly affect their intentions to download the BMI mobile application.

**H2:** After consumers are exposed to the weight control website intervention, hubristic pride will positively and significantly affect their intentions to control weight.

The current theorizing includes BMI given its importance for technology-oriented interventions for weight control (Purpura et al., 2011) and because the NHS website recommends that consumers check their BMI first before proceeding. Despite some criticisms (Burkhauser & Cawley, 2008), health-related studies have used BMI regularly (e.g., Jaworowska & Bazylak, 2009). BMI also serves to check whether consumers will feel hubristic pride due to exposure to this technological intervention. Specifically, if consumers experience hubristic pride (i.e., they believe their weight is better than that of others), those with a healthy BMI should feel particularly good about themselves. In turn, the healthy BMI consumers should show more pride than those with an unhealthy BMI. This notion is consistent with research showing that narcissistic concerns with body image and pride in own appearance are salient motives in successful weight management efforts (Colvin & Olson, 1983). In contrast, if pride is associated with a sense of goal progress (i.e., authentic pride), the level of pride should be independent of BMI and linked to the specific consumer activity completed (i.e., website exposure). Thus:

**H3:** Consumers with a healthy BMI will experience stronger feelings of hubristic pride after exposure to the weight control website intervention than consumers with an unhealthy BMI.

### **Positive and Negative Effects of Pride**

Hubristic pride could have both positive and negative effects. If consumers experience hubristic pride due to exposure to the website, they might be uninterested in interacting with the technological platform because of a lack of relevance (Salerno et al., 2015). Hubristic pride reflects individual’s identity, thus triggering a desire to differentiate from the other users of the

platform (Huang et al., 2014). This process is similar to what Ivanic (2015; Study 2) analyzed in the context of consumers’ interactions with loyalty programs. After obtaining a boost in feelings of personal status, consumers have little motivation to continue interacting with the platform. In addition, identity concerns that are part of hubristic pride might lead consumers who feel proud about their weight to discount the interactivity of the technological platform, due to a lack of congruence between the website’s focus and their identity. Consumers with high hubristic pride may believe they have already acted in accordance with the information provided or that they know all there is to know (i.e., subjective knowledge) about their weight just by visiting the website at one point; and though they still pursue regulatory behavior, their information-seeking intentions by interacting with the website may decrease. Thus:

**H4:** After consumers are exposed to the weight control website intervention, hubristic pride will negatively and significantly affect their perceived website interactivity.

Pride may also result in the formation of positive attitudes toward the website information. Prior consumer research found that emotions have a significant effect on attitudes toward advertisements (McKay-Nesbitt et al., 2011) and brand (Pham et al., 2013). Specifically, emotions positively influence attitudes toward the advertisement (Olney, Holbrook, & Batra, 1991) and act as mediators in the impact of affect intensity on attitudes toward the ad, in the case of a positive emotional appeal (Moore & Harris, 1996). Positive emotions are also associated with message liking and perceived message effectiveness (Dillard & Peck, 2000).

Because hubristic pride creates a desire for self-enhancement and distinction, consumers might have positive attitudes toward the information on the website (i.e. reading about weight control would reinforce emotional experiences and consumers’ perceived superiority) (Markus & Kitayama, 1991). This notion aligns with the self-referencing process, which relates “incoming information to aspects of the self-structure stored in memory, such as internal traits or personal

experiences” (Aaker & Williams, 1998, p. 249). Thus, hubristic pride may lead to different evaluations of the website’s interactive nature and the information on weight control. On the one hand, consumers may perceive the technological platform as low in interactivity because it is not relevant to the self. Alternatively, they may regard the website information positively because it confirms of their health-related superiority and consistency with their self-identity. Thus:

**H5:** After consumers are exposed to the weight control website intervention, hubristic pride will positively and significantly affect their attitudes toward the information on the website.

### **Interactivity and Attitudes toward the Website Information**

Research on the influence of website interactivity on attitudes toward the message produced inconsistent results (Liu & Shrum, 2009). Interactivity is not always beneficial and can backfire (Lohtia, Donthu, & Hershberger, 2003). Nonetheless, in ideal circumstances (Coyle & Thorson, 2001; Fortin & Dholakia, 2005) and from a conceptual perspective (Liu & Shrum, 2009), website interactivity has a positive effect on attitudes toward the message (i.e., information on the website).

Regarding health behavior change programs on the Internet, Evers, Prochaska, Prochaska, and Prochaska (2003) posit that interactivity (along with behavioral components and user-generated content) is key in assessing the quality of intervention websites. According to Harrison, Barlow, and Williams (2007), the interactivity of online health interventions can include a range of tools (i.e., helpline, online polls, embedded multimedia functions, downloadable information), which increase the level of interactivity.

Regarding health-related campaigns, research highlights the success of modern technology-based interventions over more traditional ones. For example, Carter, Burley, Nykjaer, and Cade’s (2013) study on the acceptability and feasibility of a weight management

intervention showed that a smartphone application and a website, respectively, were more successful than a paper diary at encouraging individuals to self-monitor for a six-month period. The interactive nature of such mediums/channels appears to determine positive attitudes and behavioral change. Hurling, Fairley, and Dias (2006, p. 759) propose that a “more interactive system would be more engaging, have a greater impact on people’s attitudes, motivation and intention and increase their (self-reported) fitness.” Particularly, they show an interactive technology-based system leads to a reduction in negative perceptions of exercise. Similarly, Webb, Joseph, Yardley, and Michie’s (2010) review shows online interventions are more efficient when they incorporate interactive methods to communicate with the participant (e.g., text messages). Finally, Harrison et al. (2007, p. 378) find that increased levels of interactivity of health-related websites “can improve the quality and the relevance of the information available to patients,” which can lead to positive attitudes toward the information on the website. Thus:

**H6:** After consumers are exposed to the weight control website intervention, the level of perceived website interactivity will positively and significantly affect their attitudes toward the website information.

### **Consumer Attitudes and Behaviors**

Attitudes toward the website information should have a significant role in the persuasion process. The Theory of Planned Behavior (Ajzen, 1985) confirms the link between attitudes and behavioral intentions; specifically, it posits that attitudes influence behavioral intentions and then actual behavior. The idea that attitudes precede behavior is central to the theory, though it is not always accepted (Manika & Gregory-Smith, 2014). The more favorable the attitude toward the object, the more likely the consumer intends to engage in the recommended behavior.

The consumer behavior literature has also examined attitudes toward the ad, which is more relevant to the attitudinal construct examined in this study (i.e., attitudes toward the

website information). Attitudes, in this context, reflect “a predisposition to respond in a favorable or unfavorable manner to a particular ... stimulus” (MacKenzie, Lutz, & Belch, 1986, p. 130). Attitudes toward the ad are also a common mediator between attitudes toward the behavior and behavioral intentions, according to the dual mediation hypothesis (MacKenzie et al., 1986). Thus, the more favorable the attitudes toward the information included in the website, the greater is the likelihood that consumers have favorable behavioral intentions. Nevertheless, the consistency of the attitude–behavior link is subject to context (e.g., Smith & Swinyard, 1983).

Shimp (1981) also notes that attitude toward the ad acts as a mediator to brand choice. Similarly, attitudes toward the information on the website can determine choice between downloading a health-related mobile phone application and other nontechnology-oriented health actions (measured here as behavioral intentions). Thus:

**H7:** After consumers are exposed to the weight control website intervention, attitudes toward the website information will positively and significantly affect their intentions to download the BMI mobile application.

**H8:** After consumers are exposed to the weight control website intervention, attitudes toward the website information will positively and significantly affect their intentions to control weight.

Finally, it is hypothesized consumers who intent to use the BMI application will be more likely to control their weight and, as a technological tool, the application should support weight control practices. Mobile applications are a viable approach to weight reduction, and consumers are more likely to self-monitor using an app than a website or paper diary (Carter et al., 2013).

Furthermore, there is a positive link between information search and behavioral intentions (Shiu, Walsh, Hassan, & Shaw, 2011). Because the BMI application provides consumers with information relevant to their own weight, it should lead to greater intentions to control weight. Thus:

**H9:** After consumers are exposed to the weight control website intervention, their intentions to download the BMI mobile application will positively and significantly affect their intentions to control their weight.

Figure 1 presents the hypothesized model of how hubristic pride, elicited by exposure to a health-related technology intervention, influences self-regulatory behavior. However, H3 – the relationship between the BMI groups and pride – is not depicted; this hypothesis serves as an emotion elicitation check (i.e., to validate that the website elicits hubristic pride experiences consistently with our theorizing).

## **METHODOLOGY**

### **Study Design**

This study uses an experimental design embedded in a survey administered over a one-week period in July 2014. Data came from a consumer panel (Qualtrics Consumer Panels) of British consumers who received an e-mail invitation to participate in the survey. This study allowed participants to choose whether they wanted to be exposed or not to the technology-oriented intervention on weight control (i.e., the NHS website for weight control). Only participants who voluntarily chose to be exposed were included in the study’s final sample (266 of 369 participants). This approach investigates web-based interventions within a more realistic setting that closely resembles actual consumers’ information-seeking processes, thus overcoming issues of artificiality, lack of generalizability (Levitt & List, 2007; Schram, 2005) and limited relevance for policymakers (Morton & Williams, 2009), which are common criticisms of laboratory experiments. Ethics approval for data collection at one of the authors’ institutions was granted before data collection.

### **Data Collection and Survey Measures**

The data collection included three stages: (1) preexposure to the technological weight control intervention stage, which measured participants’ emotions about their weight, particularly in terms of pride (and guilt; see subsequent rationale); (2) the exposure stage, in which participants were asked to choose whether they wanted to peruse the website for weight control and to self-report their behavior; and (3) a postexposure stage, which involved measuring participants’ postexposure emotions about their weight in terms of pride (and guilt), perceptions of website interactivity, attitudes toward the website information, and their resulting intentions to download the BMI phone application and control their weight in the next four weeks. This last stage also included demographic questions (i.e., gender, age, ethnicity, education, household income, and marital status) and questions about participants’ weight and height to calculate their BMI levels. Purpura et al. (2011) found most behavioral weight loss programs using technology start with a BMI calculation, using individuals’ self-reported height and weight. Moreover, as discussed previously, BMI may affect the results of the hypotheses, and consequently the BMI group serves as a control variable. BMI levels of 18.5 to 24.9 are considered healthy and BMI levels of 25 or over unhealthy (i.e., overweight or obese; OECD Health Statistics, 2013). For clarity, the survey described “weight control” before the preexposure stage, as a long-term approach to a healthy lifestyle, which includes healthy eating, dieting and weight loss practices, for maintaining or achieving a healthy weight. This ensured the two NHS web pages (i.e., about weight loss and healthy eating) were relevant to all participants, regardless of their BMI.

Established scales from prior literature were used to measure the constructs with consistent 5-point Likert-type scales. Measures of emotions about weight, inclusive of adapted pride and guilt items, came from Watson, Clark, and Tellegen’s (1988) PANAS scale and Roseman, Wiest, and Swartz’s (1994) pride scale. The pride items were adapted, since measures

for hubris can be inappropriate (Holbrook et al., 2014a; 2014b) because they contain items (e.g., arrogant, conceited, egotistical, pompous, smug, snobbish, stuck-up) that have a negative social connotation and thus are prone to socially desirable responding (Holbrook et al., 2014a; 2014b). Furthermore, research has shown consumers draw different inferences in terms of status and/or goal progress, regardless of the specific words they use to communicate their feelings of pride (Salerno et al., 2015). Consequently, the use of adapted measures of pride increased their comprehensibility and relevance for the participants and topic (Table 1). Although guilt is not part of the hypothesized model, it is used as a manipulation check. Guilt is often considered the negative counterpart to pride (Tracy & Robins, 2007). Although this study posits the target intervention would elicit positive emotions, it also measures guilt to verify if a negative affect was evoked. If so, this would affect consumers’ responses to the rest of the variables measured in the experiment (perceptions of interactivity, website attitudes, and behavioral intentions).

Website interactivity was measured with an adapted version of McMillan and Hwang’s (2002) scale. Items in this scale were measured on a 5-point Likert scale from strongly disagree to strongly agree, but given the negative valence of the statements, they were all reverse coded prior to the analysis. Attitudes toward the website information were measured with Mathwick and Rigdon’s (2004) adapted scale. Measures of intentions to download the BMI mobile phone application came from Jones, Mothersbaugh, and Beatty’s (2000) behavioral intentions measure. Last, behavioral intentions to control weight were measured on a four-week time reference (i.e., “On a scale from 1 to 5, please indicate what your intentions are to control your weight in the next 4 weeks”), based on recommendations in the literature (Chandran & Morwitz, 2005). The survey was pretested with 50 British consumers (part of the same online panel), to examine their ability to complete the questionnaire, the time required, and the initial scale reliabilities (Reid,

Worsley, & Mavondo, 2015), while also minimizing issues of common method bias, such as the reduction of item ambiguity (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

### **Manipulation Checks**

Manipulation checks show a significant ( $t_{(530)} = -3.77, p < .01, d = .33$ ) increase in pride among participants after exposure to the intervention (pride<sub>preintervention</sub>:  $M = 2.46, SD = 1.30$ ; pride<sub>postintervention</sub>:  $M = 2.93, SD = 1.54$ ), while there were no significant changes in guilt from pre- to postintervention ( $t_{(530)} = -0.13, p > .05$ ). An additional check ensured that participants who self-reported their exposure to the NHS website actually visited the website and, despite spending variable amounts of time on the website, clicked on some of its contents.

### **Sample Description**

The final sample consisted of 266 participants, with a good balance in gender (126 men, and 140 women) and age (18–26 years:  $n = 64$ ; 27–37 years:  $n = 77$ ; 38–49 years:  $n = 63$ ; 50+ years:  $n = 62$ ). Most participants had an undergraduate degree (27.8%;  $n = 74$ ), followed by those who had graduated high school (19.9%;  $n = 53$ ) and those who had some college but no undergraduate degree (19.2%;  $n = 51$ ). The vast majority of the sample (80.5%;  $n = 214$ ), was British, followed by Europeans (6.0%;  $n = 16$ ). Household income varied, with 23.7% of the sample earning £15,000–£24,999 ( $n = 63$ ) and 20.3% earning £35,000–£49,999 ( $n = 54$ ). In addition, 40.6% of participants were married ( $n = 108$ ), 28.2% single ( $n = 75$ ), and 15.4% in a relationship ( $n = 41$ ). Last, the BMI was calculated by dividing participants’ self-reported weight in kilograms by the square of their height in meters ( $\text{kg/m}^2$ ), which is a common approach in prior weight control studies and investigations (Venn et al., 2007). There was a balance between those with a healthy BMI level (53.4%,  $n = 142$ ) and those with a BMI above healthy levels

(46.6%,  $n = 124$ ; i.e., overweight/obese), as well as a balance between participants who chose to view the “healthy eating” (54.1%,  $n = 144$ ) and “lose weight” (45.9%,  $n = 122$ ) web pages.

## ANALYSES

### Measurement Model and Measurement Checks

A confirmatory factor analysis using Mplus tested the reliability and validity of the constructs (Table 1). All scales had significant factor loadings above .77 and were highly reliable and valid, with Cronbach’s alphas above or equal to .90 and average variance extracted (AVE) scores above or equal to .70, as per Fornell and Larcker (1981). The model demonstrated a theoretically and statistically acceptable overall fit ( $\chi^2 = 531.05$ ,  $df = 906$ ,  $p < .001$ ; root mean square error of approximation [RMSEA] = .07; comparative fit index [CFI] = .94; Tucker–Lewis index [TLI] = .94; standardized root mean square residual [SRMR] = .04). The chi-square value was significant due to sample size ( $N = 266$ ), but the normed chi-square ( $\chi^2/df$ ) was equal to 2.67, within acceptable values (Schumacker & Lomax, 2004). This index is less sensitive to sample size, and values less than 5 are usually considered acceptable (Schumacker & Lomax, 2004). Moreover, the chi-square index is considered unreliable when sample size exceeds 200 participants and indexes of comparative fit suggest an acceptable solution (Hair et al., 2009; Barrett, 2007). The CFI and TLI have acceptable values, exceeding .93 (Byrne, 1994) and .90 (Hu & Bentler, 1995), respectively. The RMSEA and SRMR are satisfactory, not exceeding .08 (Browne & Cudeck, 1993; Hu & Bentler, 1995). Thus, the model has an acceptable overall fit.

Table 2 shows the means, standard deviations, minimum and maximum values, and interitem correlations. As indication of discriminant validity, significant correlations between constructs varied from .19 to .47, and the Fornell–Larcker criterion ( $AVE > [r]^2$ ) indicated that

the AVEs for each construct are greater than the square of the correlation estimates. In addition, there is an adequate variable-to-sample ratio, and there are no signs of extreme multicollinearity as indicated by the variance inflation factor (VIF) (<5) and tolerance (>.22) levels for each construct (Hair, Black, Babin, & Anderson, 2009). Table 1 also shows skewness and kurtosis statistics for all individual items of the main constructs. Acceptable values for the z-score for skewness and kurtosis are between -3 and +3 (Field, 2005; Mardia, 1970). Some individual items were normally distributed because they were within these acceptable z-score values, while others illustrated departures of normality for the data in the form of either a platykurtic (flatter) or leptokurtic (peaked) distribution. However, for all items, the sample size was higher than 200 participants; therefore, in line with Hair et al. (2009), significant departures of normality do not have a substantial impact on the results.

### **Hypotheses Testing and Post-hoc Analyses**

First, differences between BMI groups (healthy vs. unhealthy BMI) are examined via a chi-square test in terms of the chosen web page participants selected to view (i.e. ‘Healthy eating’ vs. ‘Lose Weight’) and via a series of t-tests in terms of main constructs of this study (i.e. pride, website interactivity, attitudes, behavioral intentions to download the BMI app, and behavioral intentions to control weight), which includes testing H3. Subsequent analyses of H1, H2, and H4–H9 use BMI category as a control variable to test the hypothesized model’s relationships via a Structural Equation Modeling (SEM) approach. A bootstrapping technique with 1000 iterations also tests the indirect effects of the model (Figure 1), to explore the mediating mechanisms underpinning the model. Lastly, ANOVAs are used to examine differences if any among age groups for the main constructs of this study, even though not hypothesized. The results of these analyses can be seen in the next section.

## RESULTS

### Preliminary Results and H3: Differences between BMI Groups

Consumers with a healthy BMI viewed the “healthy eating” web page ( $n = 99$ ), while most consumers with an unhealthy BMI viewed the “lose weight” web page ( $n = 79$ ;  $\chi^2 = 29.79$ ,  $p < .01$ ). Significant differences were found between healthy BMI and unhealthy BMI adult groups for some of the main constructs measured in this study: pride (healthy BMI:  $M = 2.91$ ,  $SD = 1.25$ ; unhealthy BMI:  $M = 2.08$ ,  $SD = 1.29$ ;  $t_{(264)} = 5.33$ ,  $p < .01$ ) and attitudes toward the website information (healthy BMI:  $M = 3.74$ ,  $SD = .77$ ; unhealthy BMI:  $M = 3.93$ ,  $SD = .70$ ;  $t_{(264)} = -2.09$ ,  $p < .05$ ). The healthy BMI group felt more pride due to the technology intervention, while the unhealthy BMI group had more favorable attitudes toward the website information. No other significant differences were found. Thus, H3 is supported; consumers with a healthy BMI felt more pride about their weight than consumers with an unhealthy BMI.

### Structural Model

The hypothesized structural model (Figure 1) has an acceptable model fit ( $\chi^2 = 571.95$ ,  $df = 218$ ,  $p = .00$ ;  $RMSEA = .07$ ;  $CFI = .94$ ;  $TLI = .93$ ;  $SRMR = .05$ ), accounting for 31.3% of the variance in behavioral intentions to control weight, 12.3% of the variance in behavioral intentions to download the BMI mobile application, and 21.5% of the variance in attitudes toward the website information. The normed chi-square is within acceptable values equaling 2.62, and consistent with the previous discussion, all other statistics show a reasonable fit. Table 3 shows results for the direct and indirect relationships, along with a summary of the hypotheses.

Pride positively influenced intentions to download the BMI mobile phone application (H1) but did not significantly affect intentions to control weight in the next four weeks (H2). Pride also had a negative relationship to website interactivity (H4) and a positive relationship to attitudes toward the information on the website (H5), while website interactivity positively affected attitudes toward the information on the website (H6). In turn, favorable attitudes toward the information resulted in greater behavioral intentions to download the BMI application (H7) and to control weight in the next four weeks (H8), while the two behavioral intentions measures were positively associated (H9). Thus, all hypotheses were supported, except H2.

As noted previously, pride can be a double-edge sword because it has (1) a negative effect on website interactivity, which partially mediates pride’s effects on attitudes, and (2) a positive effect on attitudes toward the website information, which fully mediates pride’s effects on behavioral intentions to control weight, as the direct relationship between pride and behavioral intentions to control weight was not significant. Behavioral intentions to download the BMI mobile phone application also fully mediated both the relationship between pride and behavioral intentions to control weight and the relationship between attitudes and behavioral intentions to control weight. Last, interactivity and pride mediated the effects of pride on both behavioral intentions measures. These mediation results further advance understanding of the effects of pride on self-regulatory behavior.

### **Post-Hoc Results: Differences Between Age Groups**

Due to the violation of the homogeneity of variance assumption (Levene’s test) for attitudes toward the information on the website, the differences across age groups for this construct could not be interpreted. Significant differences were found across age groups (18-26; 17-37; 38-49; 50+) for pride after exposure to the website ( $F_{(3,262)}=4.22$ ,  $p<.01$ ), website

interactivity ( $F_{(3,262)}=5.76$ ,  $p<.01$ ) and intentions to download the app ( $F_{(3,262)}=6.02$ ,  $p<.01$ ). Specifically, older groups (38+) had less pride in their weight than younger groups (18-37). Older groups perceived the website to be more interactive, while younger groups were more likely to download the app, than older groups. No significant differences were found for intentions to control weight (see Table 4).

## **DISCUSSION**

Despite the increasing popularity of technology-based social marketing initiatives intended to promote healthy behaviors, little research has examined the psychological processes underpinning individuals' responses to behavioral change programs. This article provides new insights into how pride influences self-regulatory behavior in a technological context.

### **Theoretical Contributions**

First, this study adds to the literature on the use of technology-based social marketing interventions. In addition to the widely researched cognitive processes involved in the adoption and usage of technological platforms (Kulviwat et al., 2007), positive emotions elicited by the hedonic experience of using technology may also contribute to the success of technology-based health interventions. The findings show that feelings of pride increase as a result of exposure to a real technology-based weight control intervention aimed at British consumers. This confirms the relevance of eliciting positive emotions, rather than focusing only on negative ones as is often the norm, in social marketing interventions (Dillard & Peck, 2000). Hubristic pride directly encourages the use of other technology-based platforms (i.e., intentions to download the BMI app) but only indirectly influences nontechnology-based intentions to control weight. Thus,

consumers exposed to technology-based interventions may be more likely to adopt technology-based solutions, which then can affect nontechnology-based weight control intentions.

Second, this study contributes to the literature on pride and self-regulatory behavior. Research on the relationship between pride and generic health-promoting behaviors is only in its infancy (Mack et al., 2015), and this study is among the first to examine how hubristic pride resulting from exposure to a technology-based health intervention can influence consumers’ cognitive and behavioral processes. These findings suggest pride can be a double-edge sword – it has both positive and negative effects on attitudes toward website information and website interactivity, respectively. These novel and opposite effects are attributed to hubristic pride and its relationship to the perceived lack of relevance (to self-identity) of the website information. This study demonstrates that producing positively framed health-related campaigns can have both positive and negative consequences. Although the findings show pride leads to a desire to commit to weight control activities (pride leads to behavioral intentions to control weight through its positive affect on attitudes toward the website information), this emotion can also drive consumers away from the platform (pride decreases perceptions of interactivity, which may cause consumers to stop interacting further with the website). These results are consistent with those of Ivanic (2015), who shows that when experienced pride is linked to social status (i.e., hubristic pride rather than goal-oriented/achievement pride), consumers have limited interest in engaging again with the source of the emotion. This evidence suggests that eliciting pride can be problematic and counterproductive when the emotion encompasses the identity of the consumer (Huang et al., 2014; Salerno et al., 2015), leading to a desire to disassociate from the platform.

### **Implications for Practice**

The findings have several implications for practice. First, this study uncovers a new and complex perspective on the role of pride on technology-based social marketing interventions. That is, while pride can enhance attitudes toward the website information, it can also negatively affect perceptions of the technological platform interactivity. These effects are critical to practitioners because health interventions delivered online assume consumers’ positive responses to website interactivity and this prompts them to engage with the website in the long run to benefit from the advice provided (e.g., Papadaki & Scott, 2006). Thus, to avoid any negative effects, designers of websites with content likely to elicit positive emotions, including hubristic pride, should consider inserting marketing material that stresses the suitability of the website for the user and one’s self (e.g., use of titles such as “Helping you make informed choices that suit you the best”; “From a healthy you to a healthier you” or use of a self-assessment section titled “Let us get to know you better to offer tailored advice”). This will help counter the effect of hubristic pride on perceptions of interactivity due to a lack of self-relevance. Another potential strategy would be to stress the effectiveness of the platform so that pride can be more closely tied to goal progression (i.e., authentic pride) rather than to self-identity (i.e., hubristic pride).

Second, persuading people to change actual behavior, as opposed to momentary engaging with a technological platform, remains a challenge for marketers. Pride has a direct effect on intentions to download the BMI application but does not influence weight control intentions directly; rather, this effect is only indirect and fairly weak overall. Therefore, social marketers should capitalize on the use of technology (e.g., apps, live webchats, interactive online communities) to promote behavioral change. In today’s instant gratification culture, technology-oriented solutions may provide speedy and more effortless satisfaction of this desire than

nontechnology options. However, these interactive tools should be designed to ensure that their hedonic dimensions do not distract consumers from focusing on their health goal.

Third, given the findings that intentions to download the application and intentions to control weight are only moderately correlated, marketers should consider developing more persuasive and personalized technology-based tools. For example, they could consider using a mobile application with a personal e-health adviser that motivates consumer actions to control weight and longer-term behavioral change (e.g. the e-health adviser could provide personalized feedback or use praise to generate pride). In turn, pride would lead to positive attitudes toward the technological platform, which would encourage consistent and recurrent future behavior.

Lastly, given the age differences found for pride and intentions to download the BMI app, technology-based health interventions may increase feelings of pride more among younger adults, whom have also greater intentions to download the BMI app, than older groups. Additionally, as per the results of this study, younger adults are more demanding in terms of interactive elements of websites. Thus health interventions should be specifically designed for different age groups.

### **Limitations**

The study presents a few limitations that deserve consideration. Scales purportedly developed to differentiate between hubristic and authentic pride (Tracy & Robins, 2007) were not adopted because they did not seem suitable to the current research context. Although these measures have been criticized (Holbrook et al., 2014a; 2014b) additional research could measure both authentic and hubristic pride directly and compare their effects on other variables.

Although self-reported measures of weight and height and subsequent calculation of BMI are common in prior literature (Venn et al., 2007) future research should aim to use actual measures of participant’s weight to avoid self-reporting bias. Before and after measures could

also be used in a longitudinal study to examine the impact of weight control interventions on BMI. Nonetheless in this research, BMI was considered as a covariate in our SEM model.

Another limitation is that some participants may have been exposed to the NHS weight control website prior to the study. Only 21.4% of the sample had “*never*” searched for weight control information via any websites, the rest had searched for information via general websites at least once in the past. Future studies should explore the impact of repetitive exposure to health-related interventions and its effects on pride, attitudes and intentions.

Differences between age groups for technology-based social marketing and health interventions should also be explored but caution should be exercised in generalizing the results of the post-hoc analysis conducted in this study since this was not the focus of our research. However these results highlight potentially important implications for technology-based social marketing practice.

### **Areas for Further Research**

As Calder, Phillips & Tybout (1981, p. 202) note “often it is infeasible, if not impossible, to represent systematically all the variation in the real-world setting within a single study”. The model has been applied to a specific technology-based intervention and further testing is needed before generalizability across all health and social marketing interventions can be established. Further testing of the model in other platforms such as social networking sites, apps for mobile phones and smart watches could also prove insightful. Moreover, by employing a representative sample, by using natural actions, behaviors and an actual website, this research has aimed to achieve a high degree of likeness between “the research and the real-world [which warrant] the empirical outcomes observed may be applied in the real world” (Calder et al., 1981, p.203). Nonetheless this choice also has disadvantages as it allows less control on the experimental

setting. Consequently, further lab testing of the model presented would also help establishing the paths examined.

Although the study found pride directly affected behavioral intentions to download a mobile health application, it did not directly affect intentions to control weight. Such differences could stem from different appraisals of the target behaviors (i.e., downloading of app vs. weight control) according to the level of commitment and immediate actions required. Further research could explore potential explanations for this result and examine whether the level of commitment and the urgency of the health action moderate pride’s effects on self-regulatory behavior.

Last, the research demonstrates the need to focus on the inferences consumers make when experiencing certain emotions (Huang et al., 2014; Salerno et al., 2015) rather than on the relative effectiveness of discrete emotional reactions as suggested in previous research (Hastings, Stead, & Webb, 2004). The approach adopted suggests the need to extend current research on the effectiveness of technological interventions by considering the specific psychological processes that favor or constrain consumers’ participation in such programs. A detailed analysis of consumers’ wider emotional and cognitive processes could improve the persuasiveness of social marketing interventions. This research represents a first contribution to this complex topic.

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**Table 1.** Confirmatory Factor Analysis (CFA), AVE, CR, Cronbach’s Alphas, Tolerance, VIF, Skewness and Kurtosis Statistics.

Variables	Scale Items	Reverse Coded?	Skewness	Kurtosis	CFA Loadings	
<b>Pride</b>						
Using the words/statements below please rate how you feel about your current weight: (1 = “not at all,” 5 = “extremely”)						
	I feel proud about it.		.36 (.14)	-1.20 (.29)	.95**	AVE=.87 CR=.98 a=.98 Tolerance=.92 VIF=1.08
	I feel good about it.		.36 (.14)	-1.23 (.29)	.96**	
	I feel pleased with it.		.33 (.14)	-1.29 (.29)	.97**	
	I feel confident about it.		.36 (.14)	-1.20 (.29)	.96**	
	I feel satisfied with it.		.31 (.14)	-1.23 (.29)	.92**	
	I feel like I have self-respect due it.		.46 (.14)	-1.05 (.29)	.84**	
<b>Attitudes toward the information on the website.</b>						
The weight control information on the NHS website were: (1 = “strongly disagree.” 5 = “strongly agree”)						
	Believable		-.88 (.14)	1.11 (.29)	.83**	AVE=.70 CR=.90 a=.90 Tolerance=.76 VIF=1.31
	For me		-.58 (.14)	-.01 (.29)	.79**	
	Informative		-.64 (.14)	.48 (.29)	.88**	
	Interesting		-.36 (.14)	-.09 (.29)	.84**	
<b>Website Interactivity</b>						
Please click the appropriate circle that indicates how well you believe each of the following words or phrases describes the NHS website you viewed. (1 = “strongly disagree.” 5 = “strongly agree”)						
	Unmanageable	Yes	-.60 (.14)	-.31 (.29)	.94**	AVE=.76 CR=.91 a=.91 Tolerance=.79 VIF=1.27
	Doesn’t keep my attention	Yes	-.40 (.14)	-.66 (.29)	.85**	
	Lacks content	Yes	-.44 (.14)	-.48 (.29)	.83**	
<b>Behavioral intentions to download the BMI application</b>						
Please select the appropriate circle based on your intentions to download the NHS BMI healthy weight calculator and tracker:						
	1=Unlikely : 5=Likely		.14 (.14)	-1.35 (.29)	.93**	AVE=.72 CR=.91 a=.91 Tolerance=.87 VIF=1.15
	1=Impossible : 5=Possible		-.24 (.14)	-1.25 (.29)	.77**	
	1=Uncertain : 5=Certain		-.12 (.14)	-1.09 (.29)	.78**	
	1=No chance : 5=Certainly		.05 (.14)	-1.17 (.29)	.91**	
<b>Behavioral intentions to control weight</b>						
Please select the appropriate circle based on your intentions to control your weight in the next 4 weeks:						
	1=Improbable : 5=Probable		-.57 (.14)	-.40 (.29)	.89**	AVE=.73 CR=.93 a=.93
	1=Impossible : 5=Possible		-.72 (.14)	.13 (.29)	.84**	
	1=Uncertain : 5=Certain		-.41 (.14)	-.45 (.29)	.84**	
	1=No chance : 5=Certainly		-.49 (.14)	-.36 (.29)	.84**	
	1=Probably NOT : 5=Probably		-.65 (.14)	-.24 (.29)	.87**	

\*\*  $p < .001$ . AVE = Average Variance Extracted, CR = construct reliability

**Measurement Model:**  $\chi^2=531.05$ ,  $df=199$ ,  $p=.00$ ; CFI=.94; TLI=.94; SRMR=.04; N=266.

**Table 2.** Descriptive Statistics and Correlations.

Variables	M (SD)	Correlations				
Pride	2.53 (1.34)	1				
Website Interactivity	3.62 (1.03)	-.21**	1			
Attitudes toward the Information on the Website	3.83 (.75)	.00	.38**	1		
Behavioral Intentions to Download BMI Application	2.95 (1.27)	.19**	-.08	.27**	1	
Behavioral Intentions to Control Weight	3.77 (.97)	-.04	.26**	.47**	.31**	1

\*\*  $p < .001$ . N=266; Min-Max=1-5.

**Table 3.** SEM Results.

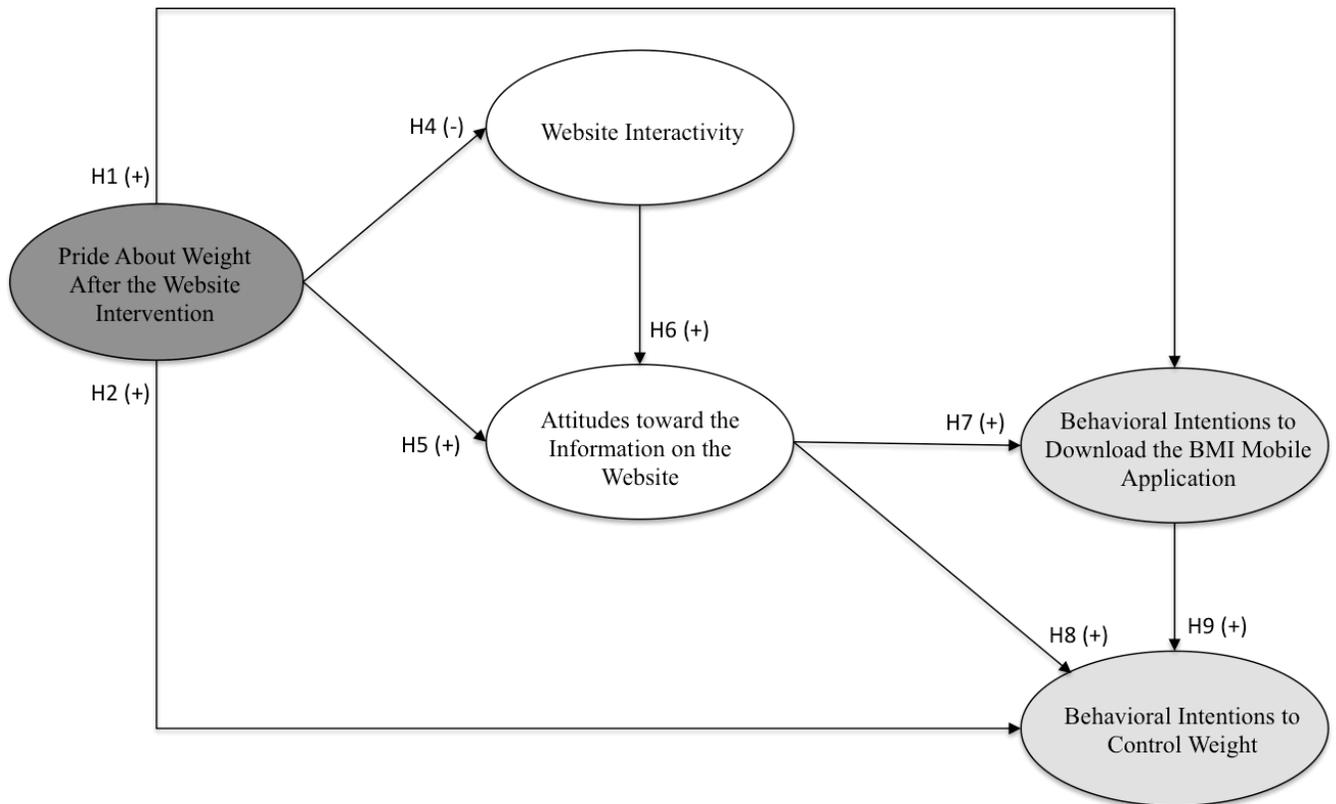
Hypothesized Relationships	Std. Loadings	S.E.	z-scores	Hypotheses Supported?
<i>Direct Effects</i>				
H1: Pride → Behavioral intentions to download BMI application	.23**	.06	3.63	Yes
H2: Pride → Behavioral intentions to control weight	-.11	.06	-1.80	No
H3: How pride levels differ among BMI groups (not examined with SEM)	n/a	n/a	n/a	Yes
H4: Pride → Website interactivity	-.25**	.06	-3.88	Yes
H5: Pride → Attitudes toward information on the website	.15*	.06	2.38	Yes
H6: Website interactivity → Attitudes toward information on the website	.46**	.06	8.11	Yes
H7: Attitudes toward information on the website → Behavioral intentions to download BMI application	.27**	.06	4.39	Yes
H8: Attitudes toward information on the website → Behavioral intentions to control weight	.45**	.05	8.15	Yes
H9: Behavioral intentions to download BMI application → Behavioral intentions to control weight	.24**	.06	4.00	Yes
BMI Category (as a control) → Pride	-.32**	.06	-5.80	n/a
BMI Category (as a control) → Attitudes toward information on the website	.18**	.06	2.92	n/a
BMI Category (as a control) → Website interactivity	-.10	.07	-1.59	n/a
BMI Category (as a control) → Behavioral intentions to download BMI application	.04	.06	.61	n/a
BMI Category (as a control) → Behavioral intentions to control weight	-.04	.06	-.75	n/a
<i>Indirect Effects</i>				
Pride → Website Interactivity → Attitudes toward information on the website	-.12**	.03	-3.39	n/a
Pride → Attitudes toward information on the website → Behavioral intentions to download BMI application	.04	.02	1.88	n/a
Pride → Attitudes toward information on the website → Behavioral intentions to control weight	.07*	.03	1.97	n/a
Pride → Website Interactivity → Attitudes toward information on the website → Behavioral intentions to download BMI application	-.03**	.01	-2.57	n/a
Pride → Website Interactivity → Attitudes toward information on the website → Behavioral intentions to control weight	-.05**	.02	-2.97	n/a
Pride → Behavioral intentions to download BMI application → Behavioral intentions to control weight	.06*	.02	2.34	n/a
Attitudes toward information on the website → Behavioral intentions to download BMI application → Behavioral intentions to control weight	.06**	.02	2.69	n/a

\*\*  $p < .01$ , \*  $p < .05$ . N=266;  $\chi^2=571.95$ ,  $df=218$ ,  $p=.00$ ; RMSEA=.07; CFI=.94; TLI=.93; SRMR=.05;  $R^2 = 31.3\%$ .

**Table 4.** Significant Differences Across Age Groups

Construct	Age Group	N	M	SD
Pride about Weight After the Website Intervention	18-26	64	2.68	1.29
	27-37	77	2.78	1.36
	38-49	63	2.55	1.41
	50+	62	2.03	1.16
	Total	266	2.53	1.34
Website Interactivity	18-26	64	3.53	0.94
	27-37	77	3.29	1.10
	38-49	63	3.93	1.04
	50+	62	3.81	0.87
	Total	266	3.62	1.03
Behavioral Intentions to Download the BMI Mobile Application	18-26	64	3.08	1.28
	27-37	77	3.31	1.19
	38-49	63	2.89	1.25
	50+	62	2.43	1.25
	Total	266	2.95	1.28

**Figure 1.** The impact of pride generated by a technology-based weight control intervention on attitudes and self-regulatory behavioral intentions.



Note: H3 (consumers with a healthy BMI will experience higher levels of pride than consumers with an unhealthy BMI) is not depicted.