CONSTRUCTING THE EXERCISING SELF:

SOCIAL MEDIA IDENTITY WORK AND EXERCISE BEHAVIOR

Shane Mannis

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Supervisor of Dissertation

_____

Robert C. Hornik, Wilbur Schramm Professor of Communication and Health Policy

Graduate Group Chairperson

_____

Joseph Turow, Robert Lewis Shayon Professor of Communication

Dissertation Committee:
Joseph N. Cappella, Gerald R. Miller Professor of Communication
Paul Messaris, Lev Kuleshov Professor of Communication

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ABSTRACT

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Shane D. Mannis

Robert C. Hornik

Far too few Americans meet the minimum recommended level of physical activity, an important component of a healthy lifestyle. This dissertation explores the motivational potential of social media as a tool in the development and maintenance of healthy exercise behaviors. The three studies contained herein develop and validate an instrument to measure exercise self-presentation in social media, the SPEQ-SM; use the instrument to assess self-presentation among a sample of exercisers; and explore the relationship between self-presentation, as measured by the instrument, and exercise behavior, using cross-sectional data. Interviews with CrossFit athletes and coaches, along with content analysis of social media profiles and fitness websites, were conducted to determine the types of exercise-related content that individuals generate and consume, as well as their motivations for creating and engaging with such content. The findings of these initial inquiries were leveraged to create surveys, administered online to samples consisting of men and women ages 18-45, most of whom were regular exercisers. Participants answered questions about their social media use, including posting and interacting with fitness-related content; their exercise behavior; their identity as an exerciser; and other psychographic characteristics. The SPEQ-SM was determined to be a good

measure of exercise self-presentation in the social media environment, with convergent, discriminant, and nomological validity of the instrument and its two subscales, impression motivation (IM) and impression construction (IC), adequately demonstrated through correlational and factor analyses. The sentiments, beliefs, and behaviors measured by the SPEQ-SM were found to be prevalent in the sample of exercisers. A small but statistically significant relationship emerged between impression construction and exercise volume, and between impression motivation and exercise intensity, both of which appeared to be mediated by identity. Causal claims cannot be made due to the cross-sectional nature of the data; however, this dissertation lays some initial groundwork for future research into the motivational potential of social media-based presentation of the self as exerciser in order to drive healthy exercise behavior.

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Background and Significance

Introduction

Obesity is becoming an increasingly prevalent problem in our culture, with negative effects felt at both the individual and societal levels in the form of ill health and early death, limited mobility, reduced productivity, prejudice, and rising medical costs, among other consequences (Bray, 2004; Finkelstein, Ruhm, & Kosa, 2005; Must & Strauss, 1999; Reilly et al., 2003). Regular exercise can be an effective part of a multi-pronged approach to combating obesity. And yet, too few Americans meet the minimum recommended level of physical activity: one recent study estimated that fewer than 10% of adults meet the standards set forth in the 2008 Physical Activity Guidelines for Americans published by the U.S. Department of Health and Human Services (Tucker, Welk, & Beyler, 2011). It is becoming clear that we are facing an epidemic of inactivity, and we need new strategies to address it.

One potential strategy has its origins in canonical sociological theory, specifically that related to self-presentation and impression management. Goffman (1959) argues that individuals strive to manage the impressions of others by presenting socially appropriate, positive images of themselves to those with whom they interact. Social media is one venue for such presentation, allowing individuals to put forth both realistic and idealized versions of themselves for public consumption (Ellison, Heino, & Gibbs, 2006; Lampe, Ellison, & Steinfield, 2007). Individuals use social media to curate an online identity; that is, to present specific

images of themselves to their circles of online friends or to the world at large (S Zhao, Grasmuck, & Martin, 2008). On sites like Facebook, Twitter, and Instagram, users can present themselves as the physically active person they are—or the one they want to be.

Social identity theory posits that individuals seek to develop a positive self-concept (Tajfel & Turner, 1979). This is developed in part through the association of the self with social categories that may include demographic categories, social roles, and membership organizations (Deaux, Reid, Mizrahi, & Ethier, 1995). Individuals might derive part of their identity from a role such as athlete or teammate, or imagine themselves part of the larger community of runners or yoga enthusiasts, or part of a more specific membership organization, such as through membership at a gym or participation in a sports league. Publicly claiming membership in these social categories helps cement the identity and leads to future behavior consistent with the identity (Schlenker, Dlugolecki, & Doherty, 1994). Terry and colleagues (Terry, Hogg, & White, 1999) note that numerous studies have shown a link between identity and behavior; identifying as a person who exercises makes one more likely to actually exercise.

My interest in this project stems from my own personal experience. As someone who has been physically active to varying degrees for the last 25 years, I have occasionally struggled to find motivation and maintain momentum in my training. I've often heard the advice that one should publicly commit to a goal in order to feel more accountable, thus increasing the likelihood of following through

on good intentions that might not be enough on their own. However, simply posting to Facebook or Twitter that I resolved to lose 10 pounds or bench press my body weight never felt particularly motivating. Then I began running and slowly—about as slowly as I circled the block on my first few attempts at this new endeavor—posts about my running began to take over my social media pages and feeds. I told my friends and followers about each new accomplishment (5 miles without stopping! 10 miles!), and I began to link up with others who were avid runners, celebrating their achievements, commiserating about workouts gone awry, and sharing training, nutrition, and equipment tips. When I branched out beyond running and entered the world of triathlon, I expanded my online activity accordingly. I was developing an exerciser identity, building and reinforcing it through my social media activities. And the more I did this, the more I felt compelled to live up to it. I began to wonder if it was just me, or if others undertook (intentionally or otherwise) a similar process. Could such a process be leveraged to help more people become physically active—and stay that way?

The three studies that make up my dissertation research represent initial steps toward understanding how people present themselves as exercisers through their social media use, how their identity as exercisers comes into play, and how these processes might affect their exercise behavior. The table below provides a summary of my studies; these are elaborated upon in the following chapters, after a literature review that provides background on identity theory in general, which forms the basis for my inquiries; exercise identity in particular, including the

various social theories that have been employed in its study; theories of self-presentation; and the role of social media in both self-presentation and exercise motivation.

Table 1: Overview of Studies

	Study 1	**Study 2**	**Study 3**
Research Questions	Which questionnaire items are useful for measuring exercise self-presentation in social media?	What proportion of current exercisers are motivated to engage in impression management related to exercise? What proportion of current exercisers employ impression construction techniques using social media? What impression construction techniques are most frequently employed?	What is the nature of the relationship between exercise self-presentation in social media and exercise behavior? What role does exercise identity play in this relationship?
Method	Cross-sectional survey		
Sample	Adults, most of whom exercise at least occasionally, all of whom use social media	Adults who are regular exercisers and use social media	Adults, most of whom exercise at least occasionally, all of whom use social media
Data Source	Survey Sampling International		

Identity Theory and Role Identities

Identity denotes an understanding or objectification of the self, or an integration of information about oneself (Holland, 1997). Identities are not monolithic, but are made up of multiple component parts, each a self-attribute or a social role (C. B. Anderson, 2004). These identities are experienced and reinforced through interaction with others (Mead, 1934; Stryker, 1968) and, collected, comprise the self (Burke & Tully, 1977). Role identities are made up of an internal component, identity, and an external one, role, and these function in relation to one another; Burke and Tully note that "there is no role/identity except in relation to counter-

role/identities" (p. 883). Anderson and colleagues write that "as social objects, role-identities are necessarily shared, are socially recognized, and are defined by action" (D. F. Anderson, Cychosz, & Franke, 1998, p. 234). Because of the social nature of role identities, present and future behavior is necessarily constrained by past behavior (that is, individuals tend to reinforce existing identities known to others by acting in accordance with them). However, as Verkooijn and de Bruijn caution, "self identity should not be considered as merely a reflection of prior behavior" (2013, p. 490). Rather, self-identity is constructed based on a number of factors in addition to behavior. I propose that self-presentation in social media can be one such factor.

According to Carter (2013), identities function in two main ways in social contexts: to distinguish individuals 1) as similar to others, and 2) as different from them. These determinations of similarity and difference are achieved through social comparison, which allows individuals to assess themselves and their behavior against a standard. For example, individuals might define themselves as exercisers if they compare themselves to others and find that they are more active than their peers. Conversely, individuals may fail to develop or maintain an exercise identity if they find that they exercise much less than their peers. Verkooijn and de Bruijn (2013) explored the role of social comparison in motivating exercise behavior. They found identity to be a partial mediator of the relationship between social comparison and exercise behavior in women, supporting the notion that social comparison aids in establishing identity, which then motivates identity-congruent behavior. Additionally, in a subset of male subjects, moderation analyses pointed to

an interaction of social comparison and exercise behavior in which the identity-behavior relationship was stronger for those who believed that they exercised less than or about as much as their peers. In other words, the ways in which participants compared themselves to others determined whether and how their exercise behavior affected their identity. Because this was a cross-sectional study, caution should be exercised in attempting to interpret these results; as the authors note, it's not possible to say with certainty whether identity influences social comparison or vice versa.

Carter explains that identities are activated in social situations "when an individual perceives that the meanings of the situation match the meanings of the identity" (2013, p. 204). Once activated, identities can then influence behavior. He further notes that identities exist in a salience hierarchy (citing Stryker's work on identity salience) and that role behaviors are chosen based on the salience of the identity activated in a situation—that is, how prominently it features in an individual's salience hierarchy. According to Callero (1985), salient role identities are more likely to be reflected in one's self-definition, and successful performance of these identities bolsters self-esteem. Role identities are validated through action, and this action will vary in accordance with identity salience. In one of the earliest studies to look for empirical evidence of this, Callero found that identity salience was linked with an increase in identity-relevant behavior, as well as an increase in perceived expectations from others related to that behavior. Put another way, when an identity is particularly salient, individuals will define themselves in part through

this identity, believe that others will expect them to act in a manner congruent with the identity, and in turn behave in accordance with the identity.

Writing on identity control theory, Burke states that "the link between identities and behavior lies in the shared meanings of each: people engage in behavior to create meanings that correspond to the meanings of their identity standard" (2006, p. 82). He notes that identity informs behavior in part through emotional response: when there is a discrepancy between their identity and their behavior, individuals feel distress; this distress is ameliorated when the discrepancy is decreased or eliminated. This is not a unidirectional relationship; instead, a reciprocal relationship has been identified between role identities and behavior, in which identity-consistent behaviors are motivated by role identity, while also informing that identity (Ajzen & Fishbein, 1980; D. F. Anderson & Cychosz, 1994; Biddle, Bank, & Slavings, 1987; Stryker & Serpe, 1982; Stryker & Statham, 1985). Thus, as Anderson and Cychosz (1994, 1995) point out, in order for an individual to develop an exercise identity, he or she must already be engaging in some degree of exercise activity. Indeed, they found that self-reported duration of exercise (in weeks) was a major predictor of exerciser identity; along with frequency per week of exercise, minutes per session of exercise, and perceived intensity of exercise, it explained 47% of the variance in exercise identity (D. F. Anderson & Cychosz, 1994).

It is not only through individual behavior that an identity is reinforced, but also through social interaction. Identity verification occurs when individuals receive feedback from others indicating that their identity performance was successful

(Carter, 2013). As people perform actions and rituals relevant to the role of exerciser, they may receive feedback from others recognizing their behavior and reinforcing their exerciser role identity by making it more salient to their concept of self (D. F. Anderson & Cychosz, 1995). Not all exercise behaviors are recognized and reinforced by others in an individual's social network, but those that are validate the individual's exerciser identity, in the process creating pressure for the individual to continue to exercise. In turn, the continued exercise serves to further reaffirm the identity. This affirmation can be bolstered through "related rituals and displays of symbols associated with being an exerciser" (ibid., p. 162). Anderson and Cychosz elaborate on these symbolic displays, mentioning athletic apparel and accessories such as gym bags. In social media, however, symbolic displays might take the form of posting workout data or gym "selfies," or liking fitness-related items (e.g., gym pages, equipment manufacturers, or so-called "fitspo" posts that aim to provide fitness inspiration). Gapin and Petruzzello also point to auxiliary behaviors employed to validate athletic identity, providing an example of a runner "buying new running clothing, reading running literature, making friends with other runners, [and] keeping a running journal" (2011, p. 1002). Social media serves as a medium to display photos of oneself in athletic clothing, repost articles from sports literature, connect with other athletes and exercisers, and share journal-style reflections on exercise activity.

Additionally, people may rely on reflected appraisals to act in accordance with their identity (Carter, 2013). These interpretations of others' appraisals of

them influence the identity process by compelling individuals to act in a way that they expect others will find to be concordant with the identity they wish to affirm. This is evident in Felson's (1985) work, which showed that people rely on representative memories of how others view them to direct their behavior. Felson demonstrated that reflected appraisals become more important when individuals have difficulty accurately judging their own identities in a situation. Social media provides ample opportunities for users to receive feedback from their networks; such feedback may be stored in memory and serve as the basis for future reflected appraisals.

Exercise Identity

Before noting the scarcity of research investigating the development and maintenance of exercise identity, Kendzierski and colleagues cite their own previous findings on the benefits of such an identity: "people who define themselves as exercisers exercise more, do more activities for exercise, and are more likely to both begin an exercise program if they haven't been exercising lately and to act on their exercise intentions than people without such a self-definition" (Kendzierski, Furr Jr, & Schiavoni, 1998, p. 176). They also note that while participating in an activity (e.g., running) may be a necessary condition for identifying as one who does (a runner), it is not a sufficient condition for such self-definition. Other factors come into play, including self-perceptions about the behavior and motivations for engaging in it, as well as acknowledgement by others—something that is frequently achieved in social media via comments, likes, and reposts. The authors propose a model in

which self-definition is the product of self-reflection, a process that requires a trigger to begin. Perhaps the process of curating one's social media content could act as a trigger.

In order for a concept such as identity to be useful in predicting outcomes, it must be measurable. One proposed measure is the Exercise Identity Scale (EIS) developed by Anderson and Cychosz (1994). In creating and validating the EIS, they found that participants who scored high on exercise identity on the nine-item scale were significantly more involved in regular exercise than their low-scoring counterparts. Subsequently, they also demonstrated a strong correlation between a two-item measure of exercise identity and self-reported exercise activity (D. F. Anderson & Cychosz, 1995). The more minutes per week subjects reported exercising (using a 30-day recall), the higher their level of exercise identity. Later work (D. F. Anderson et al., 1998) reinforced these findings and lent further support to the notion of reciprocal determinism between exercise identity and exercise behavior, also broaching the possibility of physical fitness reinforcing exercise identity. In this third study, physiological indicators such as muscular endurance and body fat percentage were also measured and analyzed, and subjects' physical fitness level was shown to be significantly positively associated with exercise identity. The researchers concluded that both physical activity and improved fitness contributed to role identity evolution, which leads individuals to maintain or expand exercise activity. Further work on the Exercise Identity Scale showed a statistically significant main effect for age on exercise identity, but failed to find significant

gender differences; age was not shown to interact with exercise activity in predicting exercise identity (D. F. Anderson, Cychosz, & Franke, 2001). In this prospective study, exercise identity was found to be a significant predictor of future exercise involvement.

Cheryl Anderson (2004) postulated that athletic identity[1] includes five correlated dimensions including physical appearance; athletic competence; level of commitment to/importance of exercise, sport, and physical activity; active efforts to confirm the athletic self through environmental choices; and support received from others as a performer of exercise, sports, and physical activity. The last category includes seeking out people, places, and situations conducive to physical activity. I suggest that social media can function as such a place, at least in the virtual sense, and that it also serves the function of connecting individuals to others who lend support to their exercise identity through recognition and validation. In addition, social media may provide a venue within which individuals can also evaluate their physical appearance (by posting and appraising photos, with feedback from others) and demonstrate their commitment to exercise (by posting exercise-related information, such as workout results or relevant articles). Anderson found support for this model—albeit with four factors rather than the hypothesized five—with two cross-sectional studies that revealed that the appearance, competence, importance, and support first-order constructs were key components of the global athletic

[1] Some authors have referred to athletic identity rather than exercise identity in their work. In such cases, I use their terminology, but the concept is essentially the same.

identity construct, with factor loadings ranging from .78 to .95. (The fifth proposed construct, environment choices, loaded on the importance factor.) Additionally, both studies found evidence of correlation between the athletic identity latent variables and self-reported physical activity, with the importance factor showing the highest correlations.

Exercise identity may be further broken down into implicit and explicit components (Banting, Dimmock, & Lay, 2009; Berry & Strachan, 2012; Hyde, Doerksen, Ribeiro, & Conroy, 2010). As Banting et al. explain, because exercise is generally thought of positively, people may explicitly identify as exercisers even if they don't exercise enough to have formed a strong implicit association between exercise and self. Berry and Strachan (2012) combined an implicit identity test with Anderson's and Cychosz's Exercise Identity Scale and measures of self-monitoring and physical activity to tease out the difference between these components. They found a small, non-significant correlation between implicit and explicit exercise identity, supporting the notion that the two are independent constructs. The authors suggest that explicit exercise identity plays a role in active self-regulation of exercise behavior, while implicit exercise identity is likely to influence spontaneous (unplanned) exercise. Banting et al. (2009) also found implicit and explicit exercise self-schemas to be distinct constructs; high levels of both predicted higher absolute levels of exercise behavior.

Miller and colleagues examined the relationship between physical activity identity (PAI; analogous in concept to exercise identity, and similarly measured

using an adaptation of the Anderson and Cychosz scale), physical activity self-efficacy (PASE), and length of time and intensity of physical activity. They found an association between vigorous activity and higher scores on both PAI and PASE scales (Miller, Ogletree, & Welshimer, 2002). Activity level accounted for more variance in both PAI and PASE than the length of time for which participants had been regularly physically active. The PASE correlation lends further support to Bandura's (1977) assertion that the primary predictor of self-efficacy is performance accomplishment; certainly participation in vigorous exercise should provide one with a greater sense of accomplishment than participation in mild or moderate physical activity. The authors therefore recommend engagement in more intense physical activity as a goal for those embarking on an exercise program. This is useful not just from the standpoint of developing efficacy, but also of developing an exercise identity. I suggest that social media can also be leveraged to help develop an exercise identity, and that this may be particularly useful in instances where vigorous physical activity is not possible in the short term but must instead be a long-term goal achieved by slowly ramping up over an extended period of time.

At least one study has shown that a strong exercise identity (that is, one that is highly salient) is correlated with over reporting of physical activity (Brenner & DeLamater, 2014). This tendency was much greater in instances where exercise was reported via survey compared to instances where exercise was reported via text messaging at the time it occurred. Because over reporting occurred in the absence of an interviewer (via a self-administered form), the authors argue that it is not due to

social desirability bias related to impression management with an other, but the result of respondents managing their own impressions of themselves. In light of this, and given that individuals can use social media to "report" their exercise activity, it seems reasonable to expect that some might engage in such reporting, whether accurate or exaggerated, to manage both their own impressions of themselves and the impressions of others. Social media provides instant feedback and a means of gauging the impressions of others via comments and likes.

A real or perceived challenge to identity can serve as motivation to engage in identity-congruent behavior. Citing Stets and Burke (2000, 2003), Strachan et al. write, "When individuals endorse a given identity, they are motivated to maintain consistency between their identity meaning and their behavior" (Strachan, Brawley, Spink, & Jung, 2009, p. 1197). Making an identity public, as one does when presenting that identity via social media, may provide additional impetus to maintain identity-behavior consistency. If regular posting of workout results, gym selfies, and exercise articles suddenly dwindles, others are likely to notice. Knowing that friends and acquaintances may question the sudden departure from fitness-related content could present an identity challenge that motivates the individual to keep exercising—and keep posting.

Murru and Martin Ginnis (2010) undertook a possible selves intervention in which participants were asked to imagine either a hoped-for possible self who was a healthy, regular exerciser, or a feared possible self, who was sedentary and unhealthy. Both conditions led to increased exercise behavior after both four weeks

and eight weeks compared to a control group. The authors claim that priming a possible self that is discrepant from the present self can act as a motivation cue, leading to behavior intended to achieve or avoid the possible self. Social media offers a forum for the presentation not just of the present self, but also of the possible self—particularly the aspirational possible self. By presenting themselves as exercisers, individuals hoping to become more physically active (or to maintain levels of physical activity) can create their own motivational cues.

Exercise Identity and the Theory of Planned Behavior

Fishbein and Ajzen's (2009) Reasoned Action Approach (RAA) provides a model in which behavioral beliefs shape attitudes, normative beliefs affect perceived norms, and control beliefs inform perceived behavioral control. These in turn influence intentions, which predict behavior. This is a useful model for thinking about how exercise related cognitions might lead to exercise behavior. However, despite the utility of this more sophisticated iteration of Fishbein's and Ajzen's prior work, the earlier Theory of Planned Behavior (TPB) is most frequently cited in the exercise literature—even papers published after the introduction of the RAA. Thus, the TPB is the model most relevant to my review of this body of work. The TPB (Ajzen, 1991) states that attitudes, subjective norms, and perceived behavioral control affect intentions, which in turn affect behaviors. A number of studies in the exercise domain have demonstrated that identity also plays a role in this process. Estabrooks and Courneya (1997) examined the effects of exercise self-schema (their term for exercise identity) on intentions and behavior, and found that exercise self-schema

predicted exercise frequency and partially moderated the intention-behavior relationship. In another study, self-identity was found to predict both exercise intention and exercise behavior, even after controlling for past behavior (Hamilton & White, 2008). Similarly, a British study noted the significant impact of self-identity on behavior when controlling for past behavior; the authors recommended targeting self-identity when designing interventions (Jackson, Smith, & Conner, 2003).

In an attempt to better understand the intention-exercise gap—that is, the sizable proportion of research subjects who do not follow through on their intentions to exercise—de Bruijn and colleagues (de Bruijn, Verkooijen, de Vries, & van den Putte, 2012) undertook a prospective study of the role of exercise identity in the theory of planned behavior (TPB). They found that only a small proportion (15%) of participants with a weak exercise identity were exercise intenders, and among these, only 20% followed through on their intentions. Conversely, more than 80% of participants with a strong exercise identity intended to exercise, and almost half of these were successful in doing so. Those with strong exercise identities who successfully exercised scored significantly higher in perceived behavioral control (PBC) and affective attitude measures than their unsuccessful counterparts. These results are aligned with previous work (Kendzierski et al., 1998; Kendzierski & Morganstein, 2009) theorizing that both enjoyment of physical activity (affective attitude) and inferences about one's ability to participate in physical activity (PBC) are salient to self-definition as an exerciser.

In a separate paper, de Bruijn and van den Putte (2012) found that high levels of exercise identity produced an exercise-intention relationship that was three times stronger than that at low levels of exercise identity. Their study demonstrated moderate correlations of intention, PBC, and exercise identity with exercise behavior, and strong correlations of affective attitude, PBC, and exercise identity with exercise intention. Exercise identity emerged as the second strongest correlate of exercise intention and was similar in magnitude to the attitude-intention correlation. In addition, stronger exercise identity was correlated not just with greater intention to exercise, but also with more vigorous exercise. The authors suggest that "exercise intention is a necessary but insufficient predictor of exercise behavior" (p. 355) and propose adding self-identity to the TPB as an antecedent to intention. (They note that both strong exercise identity and strong exercise motivation appear necessary for engaging in and maintaining exercise.) As part of the TPB (and later, the RAA), all other variables were considered to influence behavior through the model constructs. While I am not arguing against this position, I do think de Bruijn and van den Putte make an interesting point that, at the very least, speaks to the importance of studying identity as a motivating factor for behavior. Finally, they specifically recommend promotion of a strong exercise identity in order to increase the likelihood that individuals will actually engage in sufficient exercise. I will argue that social media can be leveraged to help create this strong exercise identity.

Identity has also been shown to influence other TPB constructs in a study of exercise identity, intention and behavior. Hagger and colleagues found that identity was positively correlated with PBC, affective attitude, and subjective norms; however, they found no direct effect of identity on exercise intention or behavior (Hagger, Anderson, Kyriakaki, & Darkings, 2007a). They theorize that a strong exercise identity leads an individual to form more positive attitudes toward exercise, while also developing a more robust sense of personal control over exercise behavior. Individuals with a more socially oriented exercise identity place more weight in others' beliefs about exercise, thus invoking subjective norms that motivate exercise behavior. Another study found evidence of exercise identity moderating the relationship between intention and behavior for strenuous exercise, with the relationship becoming more pronounced as exercise identity got stronger (Strachan & Brawley, 2007).

Additional work integrating role identity into the TPB was completed by Theodorakis (1994), whose two-month prospective study of female exercisers produced considerable support for the inclusion of exercise identity in the model. Identity predicted both intention to exercise as well as actual exercise behavior. The predictive strength of identity increased over time, even as the predictive strength of intention and PBC decreased slightly. This could be in part because role identity is strengthened with behavioral repetition.

Exercise Identity and Self-Determination Theory

In another study examining motivation and exercise behavior, researchers turned to self-determination theory (SDT) to explore the link between identity and behavior (Duncan, Hall, Wilson, & Jenny, 2010). SDT provides a framework for understanding human motivation, in which motivation exists along a continuum of autonomy and control such that behavior is more or less freely initiated (Deci & Ryan, 1985a). SDT considers both intrinsic motivation (engaging in a behavior because it is satisfying) and extrinsic motivation (engaging in a behavior in order to achieve a goal). Extrinsic motivation has been posited to take one of four forms (in order from least to most autonomous): external regulation, introjected regulation, identified regulation, and integrated regulation. Externally regulated behavior is performed in response to an external demand or potential reward. With introjected regulation, individuals are motivated to behave in a certain way to preserve self-worth by demonstrating ability. Identified regulation motivates people to behave in accordance with a personally important goal. Integrated regulation, also referred to as integration, is the most closely related to identity, as motivation stems from the belief that the behavior is key to supporting the individual's sense of self—e.g., going running because one thinks of oneself as a runner. Duncan et al. found that integrated regulation predicted exercise frequency (along with identified regulation) and was the sole predictor of exercise duration. They suggest that the creation of an exerciser identity—believing that "exerciser" is a key component of the self—is crucial to maintaining a regular exercise program. Work by Haase and

Kinnafick (2007) supports this notion; they conclude that self-concept and identity as an exerciser, in combination with intrinsic motivation and several other factors, aid in the maintenance of exercise behavior.

SDT was again employed as a theoretical framework in a qualitative study on identity and the maintenance of physical activity over time. Psychological need satisfaction was posited as integral to, and reciprocal with, the development and maintenance of the physically active self (Springer, Lamborn, & Pollard, 2013). Major themes that emerged from interviews with exercisers included giving and receiving support and valuing fitness status, including identity as an active person. The authors note "the self-reinforcing nature of [physical activity] in the formation of a physically active self-identity" (p. 290) and recommend focusing intervention efforts on the development of a physically active identity rather than on behavior alone. Participation in a supportive community, also referred to as relatedness, provides connection and belonging with others similarly engaged in fitness pursuits, further bolstering the active identity. Although the participants in Springer et al.'s study found this community within their exercise facility, I suggest that, in addition to providing opportunities to build and maintain an exerciser identity, social media provides a space within which to engage with others in cultivating relatedness.

Exercise Identity and Social Cognitive Theory

Social cognitive theory (SCT) has also been used to help explain the utility of identity in predicting exercise behavior. SCT proposes that behavior is influenced by both personal and environmental influences. Among the personal influences, self-

regulation is a key factor. This includes "self-monitoring of one's behavior, its determinants, and its effects; judgment of one's behavior in relation to personal standards and environmental circumstances; and affective self-reaction" (Bandura, 1991). Although identity is not explicitly included in SCT, it is easy to see its relevance to the theory, as the motivating effects of SCT constructs work to bring behavior in line with identity. Petosa and colleagues found that exercise role identity, along with key SCT constructs such as self-regulation, accounted for slightly more than 27% of the variance in physical activity (Petosa, Suminski, & Hortz, 2003). The authors attribute this low level of explained variance to their nonrandom convenience sample of college students and conclude that SCT is useful for studying exercise behavior, but the more pronounced positive results seen in other studies indicate that it might not be the best framework to employ.

Compared to Petosa et al. (2003), Strachan and Brawley (2008) found greater congruence of SCT constructs in their examination of reactions to identity challenges. In a pair of studies, one of which focused on exercise identity and behavior, participants were presented with a vignette including a hypothetical challenge to their exercise identity—specifically, they were asked to imagine that an unusually busy schedule had interfered with their exercise routine and would continue to do so for several weeks. Measures of exercise identity strength and salience were highly correlated, and individuals with stronger exercise identities demonstrated higher levels of negative affect in response to the perceived identity threat, but also stronger exercise intentions. These intentions indicate planned

efforts to achieve identity-behavior congruence in the face of an identity challenge. The authors recommend promotion of "health-related identities that favor behavior change and maintenance" (p. 586). In another examination of challenges to exercise identity, researchers presented participants with a similar possibility of exercise relapse and found that a stronger exercise identity, along with stronger personal controllability, led to an increase in negative self-conscious emotions. When exercise is closely linked to identity and relapse occurs or is possible, negative self-conscious emotions may motivate individuals to correct or prevent the relapse (Flora, Strachan, Brawley, & Spink, 2012)

Self-Presentation and Social Media

Over the last decade, social media, including social networking sites, have risen in prominence to become seemingly ubiquitous fixtures in the lives of many Americans; as of January 2014, it was reported that 74% of online adults use social media (Pew Research Center, 2014). As of September 2013, 71% of online adults reportedly use Facebook, arguably the most popular social networking site in the U.S. (ibid.). At least 56% of online adults (as of August 2012; the figure is undoubtedly higher now) post images or videos that they themselves have created or that they have borrowed from others (ibid.); we might assume that many of these are posted as part of a process of revealing interests and other aspects of the self to social media connections.

The Presentation of Self

Erving Goffman (1959) sought to explain human behavior through a dramaturgical metaphor that centers on actors and audience. Though meant to explain face-to-face interactions, the metaphor provides a useful framework for examining online interactions as well. Each interaction is a performance in which actors try to give specific impressions to their audience through information both given (explicit) and given off (implicit). The former involves the use of verbal or other means of communication solely to convey an intended message. The latter includes any actions performed for reasons other than conveying information, though actors may purposefully convey information in ways that are meant to seem unintentional. In online profiles, impressions are often given through text and given off through images (Strano, 2008). Zhao et al.'s (2008) study of Facebook users found that implicit identity claims (e.g., photos) were preferred over explicit ones (e.g., text), indicating a strong presence for showing rather than telling in the development of an online identity.

In Goffman's model, the individual has a vested interest in playing a specific role, and the other participants are complicit in helping him, employing protective practices to safeguard impressions. Or, at the very least, both actor and audience seek to maintain a surface level of agreement, or a "veneer of consensus" (p. 9) that supports the actor's calculated presentation of self. With the rise of social media, there are many more ways for one to present the self and to control the information others receive about oneself.

Social Media and Identity

Zhao et al. (2008) point to Facebook as an ideal setting for examining identity construction. The construction of an online profile "is about crafting an artifact both separate and extended from the self, both representational and self-contained" (Payne, 2007, p. 530). Profile components, often carefully and strategically selected, are meant to communicate the qualities that an individual feels are important (Ellison et al., 2006); props and settings may be used to emphasize particular qualities of the self that the user wishes to project (Hancock & Toma, 2009). Other persons in the photograph may also serve as markers of identity or group affiliation. Zhao et al. (2008) found that Facebook users preferred to situate themselves within a cultural niche—constructing identity in the context of group membership—rather than focusing on individuality.

Self-presentation may involve the use of possessions and proximal objects as sign markers of the reference group with which the individual desires to be associated. Because of the lack of physical presence on the internet, such markers must be communicated through photographs or textual references. Farquhar (2013) discusses the use of these markers, which he refers to as identity pegs, to show group orientation in social media. Posting workout data or gym photos could serve as identity pegs for those who wish to emphasize their exerciser identities. In his study, participants reported generally positive feelings toward social media photos showcasing athleticism, which were described as illustrative of health and motivation. Schau and Gilly (2003) found that individuals create digital collages as a

means of self-representation. Informants in their study indicated that developing an online presence may be seen as an opportunity not only to present the self but to construct it, creating a virtual identity that is an idealized version of the physical self.

Writing on identity and authenticity through a New Literacy Studies lens, Royce Kimmons declares that "a person's online participation should be considered as part of his or her identity, no matter what form that participation (or willing non-participation) takes" (2014, pp. 94–95). He further posits that non-anonymous social networking services such as Facebook "rely upon an underlying assumption of authentic identity" (p. 96), and argues that identity is fluid and is shaped, in part, through the media contexts in which individuals participate. Zhao and colleagues agree, asserting that "'digital selves are real, and they can serve to enhance the users' overall self-image and identity claims" (2008, p. 1831-1832). Similarly, Davis writes, "By shaping how they are seen, [social media users] are at the same time able to shape how they see themselves. This might have a very real impact upon the many socio-emotional issues tied into self and identity construction" (2010, pp. 1115–1116). Indeed, one study found that spending time on their social media profiles positively affected participants' self-esteem (Gentile, Twenge, Freeman, & Campbell, 2012). This may have something to do with the fact that the digital self is likely to be largely authentic; as Gentile et al. noted, social media "self-presentations tend to be selective and carefully managed, but not false" (p. 1929). Facebook users in particular have shown a tendency toward honesty in their identity performances,

possibly due to expected face-to-face encounters with online connections and the high potential for embarrassment should they be found to be misrepresenting themselves (Ellison et al., 2006).

Scholars examining social media and identity have discovered that "despite the social nature of these media, many [individuals] use them *primarily* for managing personal and symbolic aspects of their identity construction" (Kretz & Voyer, 2012, p. 587). One method that can aid in presenting the self—both actual and ideal versions—on social media is through public association with brands, which can act as subtle cues to identity (Hollenbeck & Kaikati, 2012). Individuals hoping to convey an exerciser identity might, for instance, "like" a relevant brand on Facebook and may even repost content from the brand to reinforce the association. For example, runners might like the page for a particular race or brand of running shoes, while CrossFit devotees might like the page for their box (a gym, in CrossFit parlance) or for the CrossFit headquarters, which posts daily workouts. Hollenbeck and Kaikati found that individuals intending to express aspects of their actual selves tended to associate with brands that maintained their self-concept, while individuals hoping to portray an ideal self selected brands meant to enhance the self.

Uimonen (2013) notes the increasing use of images to communicate relationships on Facebook, a visible rendering of the performance of both individual and collective identity. She writes, "The mediated performance of selfhood in Facebook has everything to do with visually communicating who you are" (p 124)

and claims that the act of self-representation through images on Facebook is in fact the social construction of reality. She asserts, "In performing our identities, we reveal ourselves to us and others, and through this process we also construct ourselves and our social worlds" (p. 122-123). This construction is a process of impression management, wherein users selectively portray aspects of the self while concealing others. As van Dijck (2013) points out, this can lead to the cultivation of partial identities online, with users promoting different personas in different social media profiles. Perhaps this is because, as Baym and boyd note, "Simultaneous navigation of different social and cultural worlds brought together in single social media sites presents ongoing challenges for those whose lives are multifaceted" (2012, p. 324).

Social Media and Exercise

A number of researchers have investigated connections between health behaviors and social media, and several considered exercise specifically. Ba and Wang (2013) looked at a digital health community (DailyBurn, a social media site specifically focused on exercise and nutrition) and found a high correlation between participation in the community and exercise behavior. They also found that users who achieved their goals were well connected within the digital community to others who served as motivators.

Taking a different approach, Cavallo and colleagues (2012) conducted a randomized controlled trial to test the usefulness of an intervention based in social media. Individuals were assigned to either a treatment group provided with

educational materials, self-monitoring instructions, and access to a Facebook group that provided social support, or a control group that received some limited educational material. Physical activity was assessed at the beginning of the study and again at the end, and perceived social support was also measured. However, no significant difference was found between the two groups. This may have something to do with participants being hesitant to interact with strangers, particularly around something they may consider quite personal (Cobb & Graham, 2012).

In another paper based on the same study and employing path analysis (Cavallo et al., 2013), the authors found that social support explained some variance in both intention to exercise and exercise behavior. In particular, esteem support, which includes positive feedback and affirmation from others regarding one's physical activity, was a modest but significant direct predictor of physical activity. Given the modest or nonexistent correlations found in these two analyses, there may be other mechanisms through which social media supports exercise behavior; I suggest identity processes as one such mechanism.

A Twitter study by Zhang et al. (2013) lends credence to the idea that identity, rather than social support, may be a key mechanism through which social media influences physical activity. The authors analyzed 1,500 tweets about physical activity and noted that 60% of these were about either past or current participation in physical activity or intentions to engage in physical activity, all of which can be interpreted as contributing to identity construction. By contrast, only 9% of the tweets provided social support. Users with fewer Twitter connections

were more likely to tweet positively about physical activity; this may be because they were more likely to know their connections offline and were therefore more invested in cultivating an active identity.

Taken together, I believe that these studies make a compelling case for further examination of the relationship between social media use and exercise behavior, as well as ways to leverage this relationship to increase levels of physical activity, so that more individuals reap the health benefits of regular exercise.

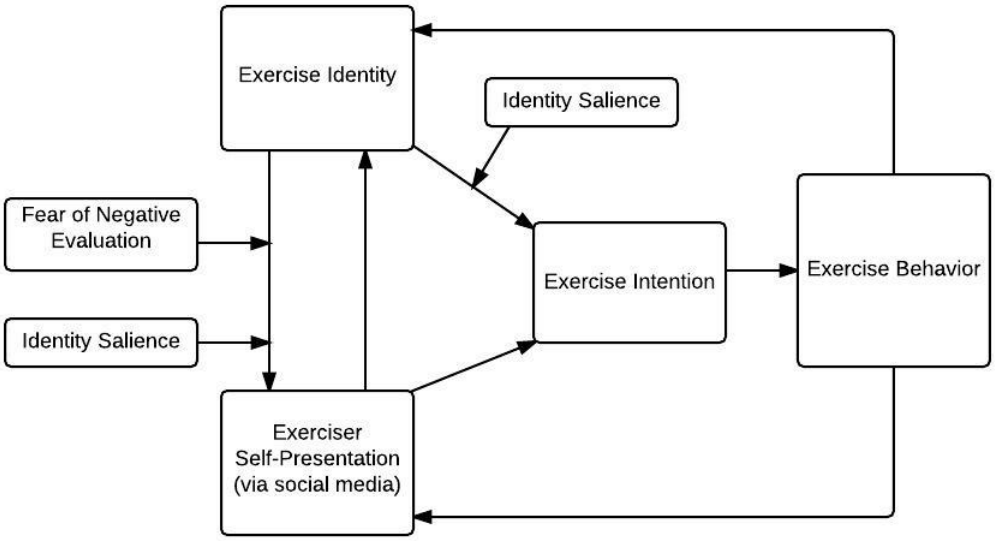
Dissertation Studies

Given the demonstrated correlation between exercise identity and exercise behavior, as well as the correlation between identity and self-presentation—both in general and on social media—I have undertaken three foundational studies to move this area of inquiry forward: 1) development and testing of an instrument to assess presentation of the self as an exerciser on social media; 2) elucidation of the frequency of social media self-presentation behavior related to exercise; and 3) elaboration of the implications of such presentation for exercise identity and behavior. My basic theoretical model is shown below.

The model posits reciprocal influence between exercise identity and exerciser self-presentation in social media. It also proposes reciprocal influence between each of these constructs and exercise behavior, with influence on behavior, in both cases, through exercise intention, as outlined in Ajzen and Fishbein's Theory of Planned Behavior, described previously. I expect the effects of exercise identity to

be moderated by identity salience—the relative importance of exercise identity to the individual's overall sense of self. In addition, the model shows fear of negative evaluation as a moderator of identity's influence on self-presentation. Individuals who fear negative evaluation are generally apprehensive that others will form negative opinions of them, and they tend to seek the approval of others, often through prosocial behaviors. I expect that individuals who score high on this psychographic factor will be more likely to express their exercise identity through their social media activity, since health and fitness are generally held in high esteem. In the following chapters, I discuss these constructs in greater detail and present specific hypotheses about the relationships summarized in the model below.

Figure 1: Theoretical Model



The three studies that comprise this dissertation build upon each other to develop support for this model and demonstrate its usefulness to efforts to increase physical activity among the general population. Study 1 begins with an exploratory

component, using interviews and content analysis to get a sense of how people use social media to develop and display their exercise identity and behaviors. It then moves on to the creation and testing of a new instrument, the SPEQ-SM (Self-Presentation in Exercise Questionnaire – Social Media), which builds on the validated SPEQ, a measure that only considers offline behavior. I use correlational analysis and factor analysis to demonstrate the convergent and discriminant validity of the new measure. Nomological validity is demonstrated through correlational analysis of the SPEQ-SM with related constructs, including causality orientation and fear of negative evaluation. Study 2 uses the SPEQ-SM to examine the rates of impression motivation and impression construction in a population of exercisers who use social media. It also considers the motivational potential of social media for exercisers by delving into the mechanisms through which exercise-related social media content influences those who create and consume it. Finally, Study 3 seeks to demonstrate what is perhaps the real raison d'être of the SPEQ-SM: its utility as a means of predicting exercise behavior. Unfortunately, as readers will see, it falls somewhat short in this last regard. However, I offer in my concluding chapter some additional context around this admittedly and necessarily limited test of the SPEQ-SM, as well as suggestions for further work that may yet cement its place among diagnostic and predictive tools leveraged in the ongoing battle for improved public health.

Study 1: Development and validation of an instrument for measuring exercise self-presentation in social media

Introduction

Conroy et al. (2000) developed the SPEQ to measure self-presentation in exercise, though I would argue that some of the items in the final instrument are not so much measuring presentation *in* exercise as presentation *related to* exercise—i.e., things that individuals might do, think, or experience even when not exercising. As outlined in my literature review, social media provides an important venue for self-presentation, yet this is not included in Conroy et al.'s questionnaire, which was developed prior to the rise of social media. In this study, I create a new version of the SPEQ focused on exerciser self-presentation in social media: the SPEQ-SM. Such an instrument can be valuable in current attempts to understand exercise-relevant attitudes and motivation and to leverage these to influence intentions and behavior.

Following a theoretical model proposed by Leary and Kowalski (1990), Conroy et al. (2000) developed and tested questions based on two key components: impression motivation (IM) and impression construction (IC). Actions undertaken in the service of IM generally seek to bolster self-esteem, develop or maintain identity, or achieve social or material outcomes (from Leary and Kowalksi, 1990; as cited in Conroy et al., 2000). IC addresses the management of behavior to attain these goals and may be influenced by self-concept, role constraints, and current and desired social images (ibid.). Given the usefulness of this model in the development of the SPEQ, I continue to leverage it in this study.

I employed the six-item impression motivation subscale of the revised nine-item version of the SPEQ (Conroy & Motl, 2003) to measure motivation for impression management. This subscale measures the general motivation to manage impressions related to exercise, and does not specifically incorporate any aspects of social media. I then sought to construct a useful measure of impression construction that takes place in the online environment, through various social media platforms. I first engaged in preliminary research to help identify the types of social media through which people might post and encounter exercise-related content, as well as the types of exercise-related content on these platforms. This was accomplished through interviews and content analysis, followed by a pretest before the main study survey.

In addition to testing questions for inclusion in the SPEQ-SM, I needed to identify potential correlates that I could use to help validate the new scale and include them in the study questionnaire. The degree of motivation to manage others' impressions of oneself should be correlated with the degree to which one fears making a negative impression on others. To measure this, I selected Leary's (1983) short version of the Fear of Negative Evaluation (FNE) Scale (Watson & Friend, 1969). As detailed in the Preliminary Research section below, I was able to further reduce this instrument to a more concise scale that maintained the same internal consistency (measured by Cronbach's alpha) as the earlier version.

Engagement in impression construction activities should be correlated with the extent to which people may be inclined to use a public commitment to exercise

in order to motivate themselves. To measure this, I elected to use the Exercise Causality Orientations Scale (Rose, Markland, & Parfitt, 2001), a validated instrument based on Causality Orientations Theory (Deci & Ryan, 1985a, 1985b). This theory proposes three categories of behavioral regulation: autonomy, control, and impersonal. People with an autonomy orientation tend to act based on personal goals and interests, while those with an impersonal orientation believe and act as though their behavioral outcomes are beyond intentional control. Individuals with a control orientation organize their behavior based on personal and environmental controls; they may rely on threats, inducements, and expectations (real or imagined) to motivate themselves. Rather than classifying people in one of these categories, the scale is meant to measure the strength of each regulatory type that motivates individuals' exercise behavior. I expected that a valid impression construction scale would be positively associated with a control orientation, because individuals with this orientation look externally for motivation—consistent with engaging in activities like creating a public online persona as an exerciser, which one must then live up to. I also expected that a valid IC scale would be positively associated, though to a much lesser extent, with an autonomy orientation, since social media can also function as a way to display one's goals and interests.

Research Question

RQ 1.1: Which questionnaire items are useful for measuring exercise self-presentation in social media?

Answering this question entailed a multistage process that began with the preliminary research outlined below. Interviews were a useful starting point because they shed light on not only social media behavior, but also the ways in which participants thought that exercise-related posting—both their own and others'—was motivating and reinforcing. Content analysis provided a clearer picture of the types of exercise-related content individuals might be exposed to on social media, and which they might share and emulate. An exploratory pretest survey (n=50) gave a clearer picture of the popularity of the different social media sites and apps mentioned by interview participants, as well as testing some general mechanism questions that arose from the interviews. The largest part of this study, the main survey (n=300), tested the SPEQ-SM items themselves to establish the validity of the scale.

Preliminary Research

Prior to embarking on the survey that forms the basis of studies 1 and 2, some preliminary research was conducted.

Interviews

Exploratory interviews were conducted with regular exercisers (a convenience sample of members at a local CrossFit affiliate gym) and fitness professionals (owners, trainers, and managers at New York City CrossFit affiliates); their input helped to shape the questions tested as part of the new SPEQ-SM instrument, as well as the questions addressing the mechanisms through which social media can

motivate users to exercise (see following chapter). These interviews also yielded a list of the most commonly used social media platforms to be included in surveys. Participants were 22 individuals, 7 of whom were fitness professionals. Ten women and 12 men were interviewed, all within the 18-45 age range intended for testing the eventual instrument. Participants' tenure as regular exercisers ranged from about a year to over two decades. All were current CrossFit participants, but most had participated in other forms of sport and exercise as adults (and sometimes as youth), including running, swimming, cycling, weightlifting/strength training, team sports, yoga, and other group exercise classes.

Most interview participants said they post to social media about new PRs (personal records; e.g., lifting a certain amount of weight for the first time or completing a benchmark workout faster than ever before), and some made regular posts about their daily workouts, though this was less common. They occasionally posted photos or videos taken during workouts, and often enjoyed when others in their social networks did the same—particularly videos showing good exercise techniques. Participants also mentioned sharing exercise-related content that they found online, such as articles and memes (often photos overlaid with humorous text).

Content Analysis

Content analysis of websites and social media profiles maintained by fitness facilities and personalities (e.g., trainers, coaches, well-known athletes) also informed the initial construction of the instrument. I began with a sample of 35

CrossFit affiliates in New York City; I looked at their websites, Facebook pages, Instagram accounts, and Twitter feeds. To supplement this, I identified 16 fitness personalities using links on the affiliate pages and snowball sampling out from these (following links on individuals' profiles) until saturation was reached. Both the content of sites and profiles—that is, the messages presented—as well as the delivery method were analyzed, using an open, qualitative approach to describe and categorize posts. This analysis yielded a list of common themes that were communicated using text, photos, and videos, providing a better understanding of the exercise-related content that subjects might be exposed to and interact with when using social media—and that they might emulate in their own social media posts. The most commonly posted fitness content included: workout details (e.g., the number of sets and repetitions of specific exercises), workout results/accomplishments, photos of athletes, videos of athletes, fitness memes, and promotion of fitness gear (e.g., clothing or equipment). Many of these are visual content; one CrossFit employee I interviewed (whose site was included in the content analysis) noted that visual content such as photos, videos, and memes yields the highest engagement rates with members at his gym.

Survey Pretest

In addition to the interviews and content analysis, an initial survey was conducted with a small sample (n=50) of respondents recruited through Survey Sampling International (SSI) to pretest some questions. Participants were roughly equally

distributed by age (18-24, 25-34, 35-45) and gender; all were at least occasional social media users.

First, the brief version of the Fear of Negative Evaluation (FNE) Scale (Leary, 1983) was tested to determine if a more concise instrument could be used in the main study. Inter-item and item-total correlations were computed for each of the 12 items in the scale, and a backward elimination method was used to create the final scale, removing items one at a time until a maximum Cronbach's alpha of .909 was obtained with seven items retained. (Cronbach's alpha for the 12-item scale was .866 in this study, quite close to the .90 alpha that Leary reported.) The complete pretest survey, including the seven retained items and five deleted items of the FNE, may be found in Appendix A.

Next, the pretest asked respondents about their social media use over the past seven days, and during a typical week. They reported days per week using each of seven different social media sites: Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, and YouTube. Facebook was clearly the most popular site, visited an average of 5 days per week. Because each social media platform was used, on average, at least once per week, all seven were retained for the main portion of the study. Finally, the pretest evaluated six proposed questions that addressed possible mechanisms through which social media might motivate individuals. These are discussed in the following chapter.

Methods

Participants

A sample of 300 participants recruited through Survey Sampling International (SSI) completed the initial test of the SPEQ-SM instrument; all were at least occasional social media users—a characteristic that was important, since the survey specifically asks about social media behavior. Respondents were selected to be equally distributed by gender and within the following age groups: 18-24, 25-34, and 35-45. Of these, 19 participants were not current exercisers, another 60 exercised some but not regularly, and the remaining 221 were regular exercisers. (The recruitment for the survey specifically sought exercisers, with the expectation that some non-exercisers and infrequent exercisers would still apply to participate.) Among the exercisers, 19% exercised 1-2 times per week; 41%, 3-4 times per week, and 37%, 5 or more times per week. (The remainder exercised less than once per week.)

Instrumentation

Demographic Information and Social Media Activity: Some demographic information (age, gender, exercise stage of change, and exercise behavior for current exercisers) was collected first. Then participants were asked about their social media use over the last seven days and in a typical week, reporting the days per week they used each of the following sites: Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube, and Reddit. Next, participants reported how frequently

they made exercise- and fitness-related posts on social media, and how frequently their friends and followers interacted with these posts. Both were reported using a seven-day recall measure and as behavior in a typical week.

SPEQ-SM and Hypothesized Correlates: Following the questions about general and fitness-specific social media use, participants answered the six items comprising the SPEQ-SM IM subscale, which deals with the general motivation to influence others' impressions related to the self as exerciser; the 15 items comprising the SPEQ-SM IC subscale, which specifically addresses social media impression construction activities; the seven items in the short version of the FNE scale; and the 21 items (seven three-part questions) in the Exercise Causality Orientation Scale (ECOS). Questions within each of these sections were presented in randomized order to prevent order effects bias.

Table 2: SPEQ-SM Impression Motivation Subscale

Answered using a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).
IM1. I value the attention and praise of others when they regard me as being in good shape.
IM2. I enjoy the praise I often receive for exercising.
IM3. I try to appear fit and healthy to others.
IM4. Receiving praise about my exercise efforts makes me want to exercise more.
IM5. I want to be thought of as a person who exercises.
IM6. I value the attention and praise offered by others in regard to appearing physically fit.

Table 3: SPEQ-SM Impression Construction Subscale

Answered using a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).	
IC1.	I emphasize my dedication to fitness on my social media profile(s).
IC2.	I post status updates about exercise and fitness on social media.
IC3.	I share information about nutrition on social media.
IC4.	I share information about my workouts and athletic activities on social media.
IC5.	I post photos of myself engaging in exercise or sports on social media.
IC6.	I post videos of myself engaging in exercise or sports on social media.
IC7.	I share the results of my fitness activities on social media.
IC8.	I prefer to connect to physically active people on social media.
IC9.	I try to have a large group of athletic friends on social media.
IC10.	I share exercise related content from others on social media.
IC11.	I post articles about exercise and fitness on social media.
IC12.	I post memes or other shared content about exercise on social media.
IC13.	I connect with sports and fitness brands on social media.
IC14.	I share my sports and exercise accomplishments on social media.
IC15.	I follow athletes or fitness celebrities on social media.

Table 4: Fear of Negative Evaluation Scale

Answered using a five-point scale (1 = not at all characteristic of me; 5 = extremely characteristic of me).	
FNE1.	I worry about what other people will think of me even when I know it doesn't make any difference.
FNE2.	I am frequently afraid of other people noticing my shortcomings.
FNE3.	I am afraid that others will not approve of me.
FNE4.	I am afraid that people will find fault with me.
FNE5.	When I am talking to someone, I worry about what they may be thinking of me.
FNE6.	I am usually worried about what kind of impression I make.
FNE7.	Sometimes I think I am too concerned with what other people think of me.

Table 5: Exercise Causality Orientation Scale

Each item for each scenario below is measured on a 7-point Likert scale (very unlikely, unlikely, somewhat unlikely, undecided, somewhat likely, likely, very likely).
ECOS1. You are beginning a new exercise program. You are likely to: a. Attend a structured exercise class where an exercise leader is telling you what to do. b. Decide for yourself which type of exercise you would like to complete. c. Tag along with your friends and do what they do. ECOS2. You are asked to keep a record of all the weekly exercise you have completed in an exercise diary. You are likely to view the diary: a. As a reminder of how incapable you are at fulfilling the task. b. As a way to measure your progress and to feel proud of your achievements. c. As a way of pressuring yourself to exercise. ECOS 3. In order to monitor how well you are doing in an exercise program you are likely to want to: a. Be given a lot of praise and encouragement from others. b. Evaluate your own performance and provide yourself with positive feedback. c. Just hope that what you are doing is correct. ECOS4. You have been exercising regularly for 6 months but recently you have been missing sessions and are finding it hard to get motivated to exercise. You are likely to: a. Approach someone to help motivate you. b. Ignore the problem; nothing can be done to improve your motivation. c. Employ your own strategies to motivate yourself. ECOS5. You have been told that setting goals is a good way to motivate yourself to exercise. You would likely: a. Set your own realistic but challenging goals. b. Make someone important to you set goals for you to aim for. c. Not set goals because you may not be able to live up to them. ECOS6. During a discussion with an exercise counselor he/she presents many options on the best way for you to exercise to achieve fitness and health benefits. It is likely that your first thought would be: a. What do you (the exercise leader) think I should do? b. What do I think is the best option for me? c. What has everyone else done in the past? ECOS7. During an exercise session how hard you are working out is likely to be governed by: a. The intensity you have been told to exercise at. b. What everyone around you is doing. c. How you are feeling whilst exercising at the intensity you choose.

Finally, respondents were asked about types of exercise in which they typically engaged, selecting as many options as necessary from a list of common activities. The complete survey is available in Appendix A.

Procedures

Recruitment procedures and the survey instrument were approved by exemption prior to study commencement by the University of Pennsylvania Institutional Review Board. Participants recruited by SSI were directed to a survey hosted by Qualtrics. Age, gender, and exercise stage of change data were used to assign participants to quotas; once quotas were filled, potential respondents were redirected back to SSI. Otherwise, they were informed of the intent of the study and consent was collected electronically within the survey. Participants completed the survey as outlined above; all data was collected from July 7-14, 2015. Initial tests of a small subset (n=29) of the planned 300 respondents showed high inter-item and item-total correlations for both the IM and IC subscales of the SPEQ-SM, so the decision was made to go forward with the questions as written for the remainder of the sample.

Analysis

In order to validate the SPEQ-SM, I first sought to establish the instrument's construct validity—convergent, discriminant, and nomological. Convergent and discriminant validity were assessed by analyzing inter-item and item-total correlations for the IM and IC subscales of the SPEQ-SM, using Cronbach's alpha as a measure of the overall reliability of the scales. Following this, factor analysis was conducted to ascertain whether the two subscales did in fact measure two separate constructs. Next, nomological validity was assessed using correlations between the

subscale scores and scores on related measures: fear of negative evaluation, causality orientation, and social media use.

I then tested whether the instrument was affected by age or gender. Finally, I conducted an exploratory factor analysis to determine if the impression construction subscale measured a single latent construct or multiple constructs. All analyses were conducted using SPSS 22 (IBM Corp., 2013). Before beginning analysis, I made the following hypotheses, which, if correct, would support the validity of the SPEQ-SM.

H 1.1: There will be a positive correlation between impression management (IM) and impression construction (IC) items, and a stronger internal correlation within each subscale than between subscales.

H 1.2: There will be a positive correlation between IM and FNE.

H 1.3: Causality orientation will be correlated with IC; specifically:

H1.3a: There will be a strong positive correlation between control causality orientation and IC.

H1.3b: There will be a weaker positive correlation between autonomy causality orientation and IC.

Results

Testing Convergent and Discriminant Validity

First, inter-item correlations and item-total correlations were examined for the six items comprising the Impression Motivation (IM) subscale of the SPEQ-SM. Inter-item correlations ranged from .507 to .754, with a mean of .607, well within the acceptable range. Item-total correlations ranged from .631 to .805, with a mean of .734. There were no items whose deletion would improve Cronbach's alpha of .902 for the scale, so all six items were retained.

Next, inter-item correlations and item-total correlations for the 15 items of the Impression Construction (IC) subscale were examined. Inter-item correlations ranged from .650 to .885 with a mean of .767. Item-total correlations ranged from .781 to .908 with a mean of .867. Cronbach's alpha for the 15-item scale was .980, and there were no items whose deletion would improve upon this. Thus, all 15 items were retained. (Of note, the removal of any item would only reduce the alpha by .001-.002, so the possibility exists for a more succinct scale, should this be desired.) Based on these correlations, the two subscales demonstrated good convergent validity.

Inter-item correlations between IM and IC items ranged from .205 to .431 with a mean of .322. These correlations, compared to the inter-item correlations within each of the subscales, helped demonstrate discriminant validity. Next, an IM total score and an IC total score were calculated for each participant by summing the six IM items and 15 IC items, respectively. The Pearson product-moment

correlation between the IM and IC scores was calculated and found to be .440 ($p<.001$).

To further assess whether the two subscales measure distinct, yet related, concepts, exploratory factor analysis was performed. Principal axis factoring was selected as the extraction method due to the likelihood of correlation between the factors, with oblique (direct oblimin) rotation. The Kaiser-Meyer-Olkin Measure was .967 and Bartlett's test of sphericity was highly significant ($p<.001$), indicating an adequate sample for the analysis. After four iterations, two factors were extracted, with eigenvalues of 12.588 and 2.671. After rotation, which converged in three iterations, eigenvalues were 12.323 and 6.228. All IC items loaded on the first factor (factor loadings ranged from .774 to .962), and all IM items loaded on the second (factor loadings between .636-.877). Hypothesis H1.1 was supported.

Table 6: Impression Motivation and Impression Construction Inter-Item Correlation Matrix

	IM1	IM2	IM3	IM4	IM5	IM6	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	IC15
IM1	1.00																				
IM2	.675	1.00																			
IM3	.564	.528	1.00																		
IM4	.683	.692	.507	1.00																	
IM5	.556	.555	.529	.531	1.00																
IM6	.754	.709	.546	.708	.561	1.00															
IC1	.365	.365	.350	.378	.314	.374	1.00														
IC2	.373	.368	.312	.341	.297	.320	.854	1.00													
IC3	.289	.247	.248	.244	.214	.263	.805	.809	1.00												
IC4	.356	.396	.320	.343	.317	.361	.841	.876	.810	1.00											
IC5	.330	.354	.302	.331	.275	.320	.772	.792	.731	.810	1.00										
IC6	.322	.343	.282	.325	.205	.308	.748	.764	.732	.761	.824	1.00									
IC7	.375	.422	.380	.389	.321	.357	.855	.885	.774	.884	.796	.753	1.00								
IC8	.404	.372	.378	.375	.328	.402	.767	.780	.744	.786	.730	.750	.775	1.00							
IC9	.359	.344	.323	.300	.273	.334	.743	.767	.697	.758	.738	.742	.769	.764	1.00						
IC10	.378	.350	.321	.326	.249	.337	.798	.815	.835	.809	.810	.758	.808	.748	.714	1.00					
IC11	.319	.279	.283	.262	.208	.269	.824	.825	.841	.833	.804	.797	.809	.773	.748	.846	1.00				
IC12	.312	.334	.290	.300	.251	.305	.785	.770	.766	.757	.767	.727	.782	.728	.738	.821	.806	1.00			
IC13	.328	.248	.262	.289	.231	.283	.741	.755	.727	.753	.712	.687	.721	.728	.767	.725	.762	.694	1.00		
IC14	.398	.431	.354	.382	.321	.382	.782	.845	.746	.861	.811	.744	.849	.760	.774	.771	.766	.736	.761	1.00	
IC15	.341	.323	.316	.322	.243	.285	.697	.685	.662	.686	.663	.668	.720	.708	.719	.670	.728	.650	.788	.701	1.00

Testing Nomological Validity

To further demonstrate the validity of the SPEQ-SM, analyses were conducted to assess its correlation with related constructs, including fear of negative evaluation, exercise causality orientation, and general social media behavior.

Some additional variables were calculated for each participant:

- FNE total, calculated by summing responses to the seven items of the Fear of Negative Evaluation Scale
- Control and autonomy orientation scores, calculated by summing responses to the seven relevant items for each orientation in the Exercise Causality Orientation Scale
- Social media use score, calculated by summing the number of days per week each type of social media was typically used[2]
- Social media fitness posting score, calculated by summing the typical frequency of posting fitness-related items on social media

As hypothesized, there was a positive correlation between IM and FNE ($r=.319$, $p<.001$). Individuals who have a greater fear of being negatively evaluated by others are more motivated toward impression management, including a desire to manage impressions related to exercise and fitness. Thus, Hypothesis H1.2 was supported, providing some evidence of nomological validity.

[2] Typical rates of social media use, fitness posting, and friend/follower interaction were compared to reported activity over the past seven days and found to be highly correlated.

Next, correlations were calculated for impression construction (using the IC total variable) and exercise causality orientation. Of the three orientations assessed by the ECOS, impression construction was most closely correlated with control orientation ($r=.675$, $p<.001$). That is, individuals who tend to rely on threats, inducements, and expectations (real or imagined) to motivate themselves were most likely to engage in impression construction techniques. IC was correlated to a much lesser degree with autonomy orientation ($r=.280$, $p<.001$). Autonomy-oriented individuals are motivated to act based on personal goals and interests; thus, they did not need to engage in impression construction activities on social media to motivate themselves to exercise. Hypotheses H1.3a and H1.3b were supported, providing further evidence of nomological validity. Additionally, there was a strong correlation between the IC total and social media use score ($r=.687$, $p<.001$). This provides some additional minor support for IC as a good measure, since individuals have to use social media in order to engage in social media-based IC activities.

Additional Analyses

One-way ANOVAs were run to test for effects of age and gender on both IM and IC. There was no effect of age on either score, and no effect of gender on IM. However, a small but moderately significant effect of gender was detected on IC ($r=.115$, $p<.05$). Men were slightly more likely than women to engage in impression construction. (Conroy and Motl found the same in their 2003 SPEQ study.)

Bivariate regression analyses were run to test for an effect of exercise stage of change (SOC) on the two SPEQ-SM subscales. While there was no effect of SOC on IC, there was a small but significant effect of SOC on IM (β=.186, $p<.001$). Only about 3% of the variance in IM is attributable to SOC. This slight increase in impression motivation makes sense; as individuals engage in regular exercise over longer periods of time, they are more likely to value the effects, including positive feedback from others about their efforts.

Dimensional Analysis of IC Subscale

As a final step, an exploratory factor analysis was conducted on the 15 items of the IC subscale to determine if they represented a single construct or multiple latent factors. Because of the high inter-item correlations among all the variables, if there were multiple latent factors represented, they would almost certainly be correlated. Thus, principal axis factoring was selected as the extraction method and direct oblimin as the rotation method. The Kaiser-Meyer-Olkin Measure was .973 and Bartlett's test was highly significant ($p<.001$), indicating an adequate sample for the analysis. After three iterations, a single factor was extracted (eigenvalue = 11.527); all items in the scale loaded on this factor. Extraction communalities ranged from .621-.845, indicating that the underlying latent factor explained high proportions of the variance in all variables in the scale. Given the single factor nature of the IC scale, no further analysis was conducted.

Discussion

The purpose of this study was to identify questionnaire items that are useful for measuring exercise self-presentation in social media, and then to validate an instrument, the SPEQ-SM, that includes these items in one of its two subscales, impression motivation (IM) and impression construction (IC). Preliminary research, including interviews and content analysis, informed the development of a rich set of questions measuring a range of possible exercise-related social media posting behaviors. These questions comprised the IC subscale. All items included in each subscale of the SPEQ-SM were shown to be highly correlated, and the two subscales showed a moderate correlation with each other. Factor analysis confirmed that impression management and impression construction are two separate but related concepts. Additional factor analysis showed that the items comprising the IC subscale were indicators of a single latent construct, providing further evidence of the scale's coherence.

The positive correlation between IM and FNE provided some evidence of nomological validity. Naturally, those who are concerned about the negative impressions of others are interested in influencing those impressions. It follows that individuals who have a greater fear of being negatively evaluated by others are more motivated toward impression management, including a desire to manage impressions related to exercise and fitness.

In addition to managing impressions, social media activity serves a motivating function. Of the three orientations assessed by the ECOS, impression

construction was most closely correlated with control orientation. That is, individuals who tend to rely on actual or imaginary threats, inducements, and expectations to motivate themselves were more likely to engage in impression construction techniques than were individuals who are motivated to act based on personal goals and interests (autonomy orientation). Put another way, individuals seeking external sources of motivation were most likely to create these for themselves through their social media activities.

One strength of this study is that it builds on an established measure, and uses other validated instruments to help establish the validity of the new, updated measure. The sample size used was sufficient to demonstrate both the high correlations among variables of interest and the low variance across demographic groups. There are some minor limitations inherent in this study. First, cross-sectional studies by their nature do not support causal claims. However, as the aim of this study was primarily to examine correlations rather than to model cause and effect, a cross-sectional survey is an acceptable approach. Second, while using SSI to recruit participants is efficient and cost-effective, the opt-in, non-probability sample requires that caution be used in generalizing results to the larger population. However, the lack of big differences in means on the scales across a range of ages, genders, and exercise stages of change suggest the instrument may be broadly applicable.

A logical (and important) extension of this work is to examine correlations between the SPEQ-SM components and actual exercise activity—and then, ideally, to demonstrate a causal relationship between impression construction activities and exercise. Study 3 of this dissertation undertakes the first of these.

Study 2: Describing the nature of social media behavior related to exercise

Introduction

This study builds on Study 1 by using the SPEQ-SM to examine the rates of exercise impression motivation and impression construction in exercisers. It also explores the mechanisms through which social media content about exercise might motivate the individuals who both post and view such content. That is, how does posting, viewing, connecting, and interacting factor into the motivational potential of social media? For this study, I analyzed data from participants in Study 1 who identified themselves as current exercisers, since a number of the impression construction and mechanism items are contingent on engaging in at least some physical activity.

Research Questions

This study addresses the following research questions:

RQ 2.1: What proportion of current exercisers are motivated to engage in impression management related to exercise?

RQ 2.2: What proportion of current exercisers employ impression construction techniques using social media?

RQ 2.3: What impression construction techniques are most frequently employed?

RQ 2.4: What are the mechanisms through which social media can motivate individuals to exercise?

Methods

This study leverages data gathered during the pretest and final survey of Study 1 to address these research questions. The participants and their demographic characteristics were described in the previous chapter, which also presented evidence for validity of the IM and IC scales.

Instrumentation

As noted above, basic demographic information (age and gender) was collected, as well as exercise stage of change and exercise behavior for current exercisers. Participants were also asked about their social media activity, both general social media use and exercise-specific activity. In addition, they answered questions about some possible mechanisms through which exerciser self-presentation on social media might affect exercise behavior.

Mechanisms: Exploratory interviews conducted prior to Study 1 elicited possible mechanisms through which exercise- and fitness-related social media content could motivate the individuals who both post and view it. Interviewees frequently indicated that they enjoyed sharing their fitness accomplishments with friends via social media, and that they appreciated the positive feedback that their fitness posts often garnered. They also enjoyed seeing their social media connections' fitness posts, and were occasionally inspired by their progress, including being motivated by a sense of friendly competition. Some participants hoped that their fitness posts would motivate others to exercise. Many agreed that posting exercise intentions

online made them feel more accountable and thus somewhat more likely to follow through on their workout plans.

The initial 50-person pretest survey also evaluated six proposed questions that addressed possible mechanisms through which social media might motivate individuals. Respondents in this small pre-sample were not asked about their exercise habits as part of the screening process, so the mechanism questions were worded more generally than they would be in the next stage of the study; e.g., "Posting my intentions to do something on social media makes me more accountable to my friends and followers" rather than "Posting my intentions to exercise on social media makes me more accountable to my friends and followers." Participants indicated their level of agreement with each statement, from "strongly disagree" (1) to "strongly agree" (6). Means for the six items ranged from 3.88 to 4.38, indicating that, on average, participants were at least somewhat in agreement with the statements. There was also sufficient variation in the responses (see table below). Thus, all six were deemed useful and retained for the main portion of the study, with modifications to focus on exercise and social media.

Table 7: Pretest of Mechanism Items	Mean	Standard Deviation
Posting my intentions to do something on social media makes me more accountable to my friends and followers.	3.94	1.52
Posting information about my activities to social media makes me more accountable to my friends and followers.	3.88	1.41
I get support for my endeavors from friends and followers on social media.	4.32	1.22
I learn new information about things I care about from my network on social media.	4.38	1.41
I am inspired to do things by posts I see on social media.	4.04	1.29
Social media connects me with a community of people who care about things that are important to me.	4.36	1.17

The final wording of the mechanism questions for the main study is shown in the table below.

Table 8: Final Mechanism Items

M1.	Posting my intentions to exercise on social media makes me more accountable to my friends and followers.
M2.	Posting information about my workouts and fitness activities to social media makes me more accountable to my friends and followers.
M3.	I get support for my exercise endeavors from friends and followers on social media.
M4.	I learn new information about exercise and fitness from my network on social media.
M5.	I am inspired to exercise by posts I see on social media.
M6.	Social media connects me with a community of people who care about exercise and fitness.

Procedures

As previously described, recruitment procedures and the survey instrument were approved by exemption prior to study commencement by the University of Pennsylvania Institutional Review Board. Participants recruited by SSI were directed to a survey hosted by Qualtrics. Age, gender, and exercise stage of change data were used to assign participants to quotas; once quotas were filled, potential respondents were redirected back to SSI. Otherwise, they were informed of the intent of the study and consent was collected electronically within the survey. Participants completed the survey as outlined above; pretest data was collected June 8-10, and the main study data was collected from July 7-14, 2015.

Analysis

To answer the research questions posed, mean scores and standard deviations were calculated separately for each IM, IC, and mechanism item from the survey. The percent of exercisers agreeing at least somewhat with each item was also calculated

by creating a binary variable from the six-point Likert responses. These new variables were used to calculate proportions of exercisers who were motivated to engage in impression management and who actually engaged in impression construction activities. The binary mechanism variables were used for analyses requiring counts (e.g., the number of IC activities a participant has ever engaged in) and proportions (e.g., the percent of exercisers who ever engage in an IC activity, the percent of exercisers who agree at least somewhat with a mechanism statement). Summed variables were also created, using the original IM variables and the binary IC variables. The summed variables were used to plot the distribution of IM strength among exercisers, as well as the number of IC activities they engaged in.

Results

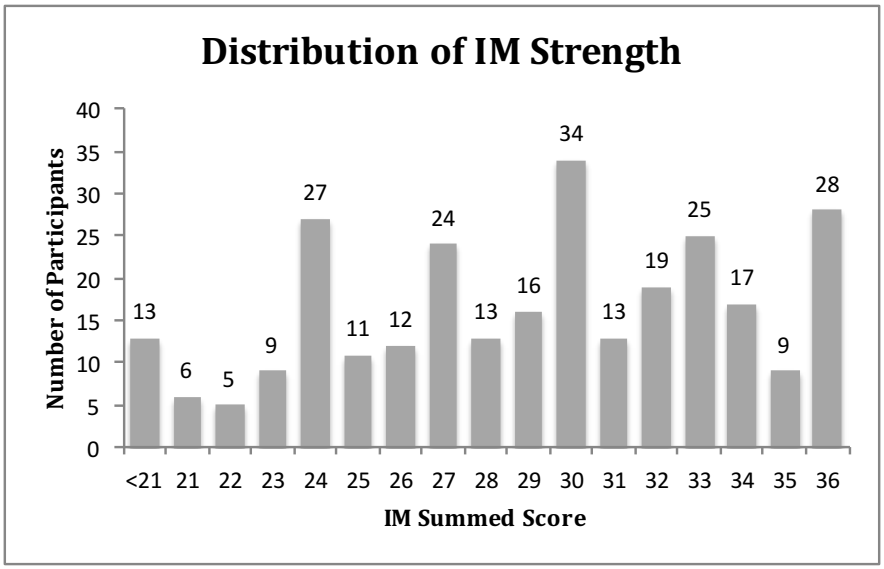
RQ 2.1: What proportion of current exercisers are motivated to engage in impression management related to exercise?

The six IM variables were recoded into new variables, where all disagree statements were coded as 0 and all agree statements were coded as 1. The table below shows the percent of exercisers agreeing at least somewhat with each IM statement. It also shows the mean score (on a 1-6 scale) and standard deviation for each item before the recode.

Table 9: Impression Motivation Among Exercisers	% of Exercisers Agreeing (n=281)	Mean Score	Standard Deviation
I want to be thought of as a person who exercises.	95.70%	4.93	0.9
I value the attention and praise offered by others in regard to appearing physically fit.	92.90%	4.78	0.99
I value the attention and praise of others when they regard me as being in good shape.	92.20%	4.82	1
Receiving praise about my exercise efforts makes me want to exercise more.	91.80%	4.79	1.04
I enjoy the praise I often receive for exercising.	91.50%	4.74	1.1
I try to appear fit and healthy to others.	91.50%	4.85	1.05

A new variable was computed by summing the 6 original IM variables, to provide an estimate of the strength of each respondent's impression motivation. The maximum possible score on this variable was 36; the minimum possible was 6 (however, the observed minimum was 10). A score of 21 would represent a net neutral position; anything below this indicates a lack of motivation. The mean of this new variable was 28.9, suggesting that, on average, exercising participants were motivated toward impression management. In fact, 93% of exercisers scored above 21, indicating that they were at least somewhat motivated to manage exercise related impressions. Slightly more than half (52%) of exercisers scored 30 or above, indicating moderate to strong impression motivation.

Figure 2: Distribution of Impression Motivation Strength Among Exercisers

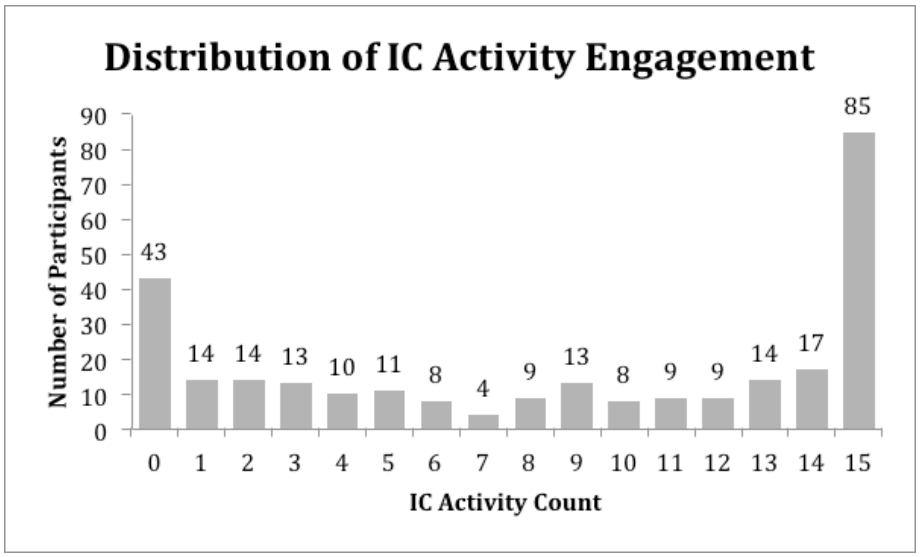


RQ 2.2: What proportion of current exercisers employ impression construction techniques using social media?

The 15 IC variables were recoded into new variables, where all disagree statements were coded as 0 and all agree statements were coded as 1. A new variable was computed by summing the 15 recoded IC variables, to provide a count of the number of IC activities each respondent reported engaging in at least somewhat. With 15 IC activities, the maximum possible score on this variable was 15; the minimum was, of course, zero. The mean of this new variable was 8.62, suggesting that, on average, exercising participants engaged in a little over half of the IC activities at least occasionally. However, the distribution of the IC count variable was decidedly non-normal, with almost half of participants falling at either end of

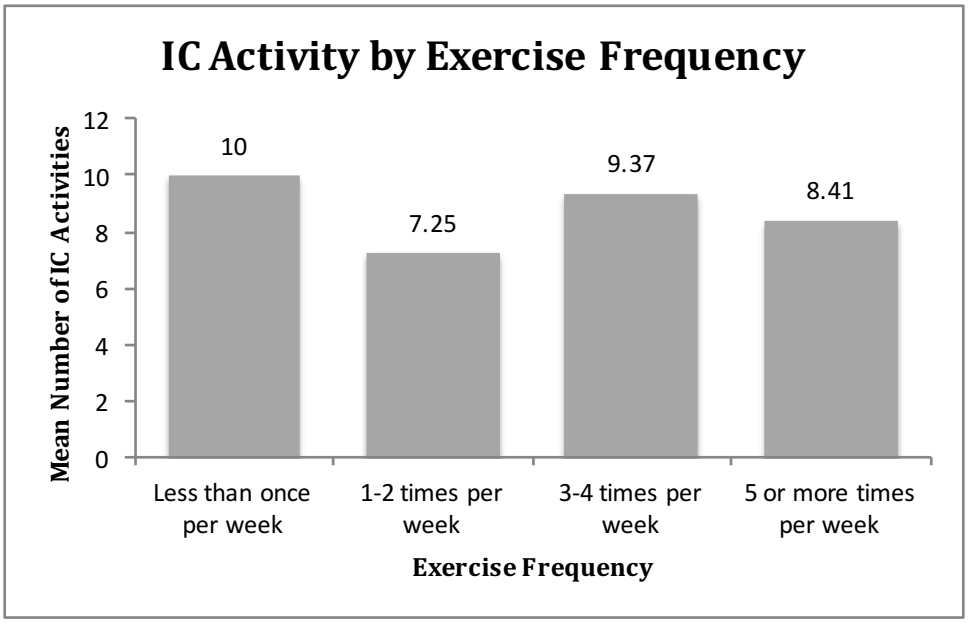
the scale and the rest distributed somewhat evenly between the two extremes. Eighty-five percent of participants engaged in at least one impression construction activity.

Figure 3: Distribution of IC Activity Engagement Among Exercisers



To determine whether engagement in IC activity varied with engagement in exercise activity, mean IC count was calculated for each exercise frequency category (less than once per week, 1-2 times per week, 3-4 times per week, and 5 or more times per week). Interestingly, those who exercised least reported engaging in the most IC activities.

Figure 4: Mean Impression Construction Activity Count by Exercise Frequency



Crosstab analysis revealed a statistically significant (χ^2=18.37, p<.05) relationship between exercise frequency and impression construction activity. In Study 3, I move beyond descriptive statistics and look more closely at this relationship, using more precise measurements for exercise activity.

Table 10: Impression Construction Activities by Exercise Frequency Crosstab

	Less than once per week	1-2 times per week	3-4 times per week	5+ times per week	Total
0-3 IC activities	0 (0%)	21 (38.9%)	30 (25.9%)	33 (31.7%)	84 (29.9%)
4-10 IC activities	4 (57.1%)	13 (24.1%)	22 (19.0%)	24 (23.1%)	63 (22.4%)
11-14 IC activities	0 (0%)	12 (22.2%)	24 (20.7%)	13 (12.5%)	49 (17.4%)
All 15 IC activities	3 (42.9%)	8 (14.8%)	40 (34.5%)	34 (32.7%)	85 (30.2%)
Total	7 (100%)	54 (100%)	116 (100%)	104 (100%)	281 (100%)

Analysis of the relationship between strength of impression motivation (the IM total variable) and number of impression construction activities engaged in (the IC count variable) revealed a moderate and highly significant positive correlation ($r=.379$, $p<.001$), indicating that as impression motivation strength increased, impression construction activity also increased. To further explore this relationship, a binary variable was created to distinguish between exercisers with moderate to high IM ($IM \geq 30$; $n=145$) and those with lower IM ($IM<30$; $n=136$). For those with moderate to high IM, the mean number of IC activities was 10.5; for those with lower IM, it was 6.6. An independent samples t-test showed that the difference in means was highly significant ($p<.001$).

RQ 2.3: What impression construction techniques are most frequently employed?

The percentages in the table below indicate the proportion of exercisers ($n=281$) who report engaging in each IC activity at least somewhat. The table also shows the original mean score (on a 1-6 scale) and standard deviation for each item. Interestingly, sharing nutrition information topped the list, along with items related to connection: connecting with sports and fitness brands, following athletes and fitness celebrities, and connecting with physically active people. Participants were slightly more likely to share exercise-related content from others than to share their own exercise content, but the difference was minimal. Posting videos of oneself engaging in sports and exercise was the only impression construction technique

that fewer than half of the respondents engaged in; otherwise, all techniques included in the survey were employed with some regularity, and similar frequency.

Table 11: Impression Construction Among Exercisers

	% of Exercisers Agreeing	Mean Score	Standard Deviation
I share information about nutrition on social media.	63.70%	3.67	1.7
I connect with sports and fitness brands on social media.	63.30%	3.7	1.63
I follow athletes or fitness celebrities on social media.	62.30%	3.72	1.73
I share exercise related content from others on social media.	61.20%	3.65	1.69
I prefer to connect to physically active people on social media.	59.40%	3.69	1.6
I share my sports and exercise accomplishments on social media.	58.00%	3.56	1.65
I post status updates about exercise and fitness on social media.	57.70%	3.51	1.69
I emphasize my dedication to fitness on my social media profile(s).	57.30%	3.59	1.68
I share information about my workouts and athletic activities on social media.	56.90%	3.54	1.7
I try to have a large group of athletic friends on social media.	56.90%	3.57	1.69
I post articles about exercise and fitness on social media.	56.20%	3.51	1.71
I share the results of my fitness activities on social media.	55.90%	3.52	1.71
I post memes or other shared content about exercise on social media.	55.50%	3.46	1.69
I post photos of myself engaging in exercise or sports on social media.	53.70%	3.43	1.77
I post videos of myself engaging in exercise or sports on social media.	44.10%	3.08	1.76

RQ 2.4: What are the mechanisms through which social media can motivate individuals to exercise?

The six mechanism variables were recoded into new variables, where all disagree statements were coded as 0 and all agree statements were coded as 1. The table below shows the percent of exercisers agreeing at least somewhat with each mechanism statement. It also shows the mean score (on a 1-6 scale) and standard deviation for each item before the recode. And, as the Pearson correlations in the table show, all six were found to be highly correlated with impression construction—in other words, exercisers who agreed with the mechanism statements were more likely to engage in impression construction activities.[3]

Table 12: Mechanism Assessment

	% of Exercisers Agreeing	Mean Score	Standard Deviation	Correlation with IC (p<.001)
I learn new information about exercise and fitness from my network on social media.	79%	4.25	1.5	0.715
I am inspired to exercise by posts I see on social media.	79%	4.23	1.46	0.717
Social media connects me with a community of people who care about exercise and fitness.	73%	4.08	1.52	0.764
I get support for my exercise endeavors from friends and followers on social media.	68.70%	3.92	1.61	0.809
Posting my intentions to exercise on social media makes me more accountable to my friends and followers.	66.50%	3.86	1.6	0.806
Posting information about my workouts and fitness activities to social media makes me more accountable to my friends and followers.	64.40%	3.81	1.6	0.819

[3] Although the term "mechanism" may suggest mediation, this analysis is not intended to address mediation. Instead, I present correlational data as a way of validating the proposed mechanisms, with the expectation that impression construction should increase as agreement with the mechanisms increases.

Discussion

The purpose of this study was to describe exercise-related impression motivation and impression construction activities among a sample of adult exercisers, as well as to examine some mechanisms that could, along with impression motivation, help explain the impression construction behavior. Of the 281 exercisers included in the study, most scored high on IC and IM measures, and most appeared to derive at least some motivation to exercise from their social media posting activities, through the proposed motivational mechanisms.

There was a high level of agreement with all of the impression motivation questions of the SPEQ-SM; more than 90% of the exercisers surveyed responded in the affirmative to each of the six questions, suggesting that the themes presented in the questions resonate with fitness-minded individuals. A large proportion of the current exercisers in this study were motivated to manage impressions related to exercise—93% of them had a score greater than 21 on the composite IM measure, indicating that they were at least somewhat motivated toward impression management. And a slight majority of them were more than somewhat motivated; 52% scored 30 or above, indicating moderate to strong impression motivation. These participants wanted to be recognized as exercisers, and as fit and healthy individuals. They appreciated the positive feedback that their fitness efforts afforded them. This is, perhaps, not particularly surprising; after all, it's not unusual to appreciate recognition for something to which one dedicates a good deal of time

and energy. Arguably, the more interesting part of the story is the impression construction activity.

Eighty-five percent of exercisers reported engaging in at least one impression construction activity—slightly lower than the 93% who were at least somewhat motivated toward impression management, but significantly higher than the 52% with moderate to high impression motivation. Two thirds of exercisers (67%) reported engaging in at least five IC activities, and fully half reported engaging in ten or more. Those who exercise more do not necessarily engage in more IC activity; there is a good amount of exercise-related social media activity among all exercisers. However, those with higher impression motivation do engage in quite a bit more impression construction—60% more, on average, than their low-IM counterparts. This suggests that impression motivation, rather than exercise participation, is the driving force behind impression construction efforts.

With the exception of posting videos of oneself engaged in fitness activities, all of the IC items were practiced by at least half of respondents. (Creating a video is, arguably, the most time- and labor-intensive of the IC activities listed.) None, however, were practiced by more than two-thirds of respondents. Looking at the respondent-level engagement rates and the item-level engagement rates together, it becomes apparent that the subset of IC activities engaged in varies widely among individuals. This both underscores the breadth of individual approaches to exercise-related impression management and supports the usefulness of retaining all 15 IC items in the SPEQ-SM. Overall, exercise self-presentation in social media was shown

to be prevalent enough to make a good case for the SPEQ-SM as a generally useful tool.

How, then, does such social media activity serve a motivational function? Analysis revealed that all six motivational mechanisms addressed in the study were likely benefits—and drivers—of IC activity. Mechanisms related to both accountability and support were the most highly correlated with impression construction, while those about information, inspiration, and community were acknowledged as motivational forces by the largest percentage of exercisers. In general, participants in this study agreed that their exercise-related social media activity had high motivational potential.

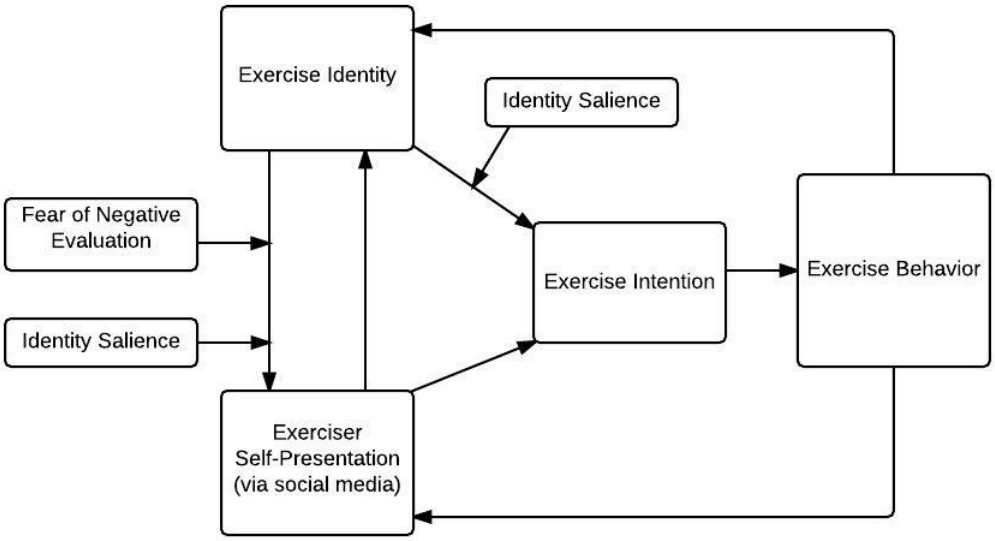
One limitation inherent in this study, as noted for the prior study, is that SSI uses an opt-in model for panelists. As such, one must use caution in generalizing the results. In other words, the strength of impression motivation, as well as the number and type of impression construction activities undertaken, may differ between a group who self-selected into a study about exercise and social media and the larger population of exercisers. Additional testing with different groups of exercisers would reveal whether these findings are anomalous or indicative of a larger trend.

Study 3: Demonstrating the relationship between self-presentation as an exerciser in social media, exercise behavior, and exercise identity

Introduction

In Study 1, I developed the SPEQ-SM, an instrument for assessing self-presentation as an exerciser via social media, and in Study 2, I examined the incidence of the motivations and behaviors measured by the instrument. In this, the final study of my dissertation, I looked for correlations between the SPEQ-SM, measures of exercise identity, and exercise behavior. Exercise identity has been shown to be correlated with exercise behavior (Estabrooks & Courneya, 1997; Grove & Dodder, 1982; Jackson et al., 2003; Kendzierski, 1988). Identity and self-presentation (both online and off) are quite logically correlated, and this is also reflected in the literature (Leary & Allen, 2011; Leary & Kowalski, 1990; Schlenker, 2003; Uimonen, 2013; S Zhao et al., 2008). With this study, I sought to demonstrate that the aforementioned relationships applied to presentation of the exercising self on social media specifically, following the theoretical model below. I hoped to show a correlation between self-presentation as an exerciser on social media and exercise behavior—a correlation that I expected to remain when controlling for exercise identity and identity salience. If this relationship was supported by the data, it might point toward the usefulness of exerciser self-presentation as a strategy for driving exercise behavior.

Figure 5: Theoretical Model



I expect that identity will influence self-presentation in social media environments, because social media is, in part, a medium for performance of the self. If one version of the self is self as exerciser (i.e., the individual has an exercise identity), evidence of this should be seen in the individual's social media activity—and the stronger the identity, the more it should be reflected in social media. I also expect that exerciser self-presentation will influence exercise identity. Social media offers a unique opportunity not just for identity display, but for identity work—that is, taking on the trappings of being an exerciser, even as one is just beginning to identify as such. Presenting as an exerciser can help a new (or aspiring) exerciser build up their exercise identity. The reciprocal link between identity and behavior has been demonstrated many times over (see above, and also literature review). The bidirectional influences between self-presentation and behavior are also not new, although to my knowledge, the specific connection between exerciser self-

presentation in social media and exercise behavior has yet to be explored. I expect exercise behavior to have a positive effect on self-presentation, because as one exercises more, one naturally has more exercise-related content (progress reports, workout logs, photos, etc.) to share via social media. But I also expect that the more exercise-related content a person shares and engages with on social media, the more compelled that person will feel to exercise—in part because they've created an image of themselves as an exerciser, which they now must live up to, but also because by engaging in exercise-related exchanges in social media, they're gaining support, knowledge, and inspiration.

Before delving into methods and analysis, it may be helpful to consider some of the model constructs in more detail. In developing this model, I thought of identity and identity salience as two distinct but closely related concepts. Stets and Burke (2003) suggest that identity is tied to the different roles or positions each person holds within the overall social structure, and that each person's concept of self is made up of a collection of identities. Thus, a person might hold identities such as parent, physician, chess player, wine aficionado, and runner. I am interested in whether participants in this study have, among their many different identities, an exercise identity. And then, if they do hold this identity, I am interested in the salience of the identity. Callero described salience as "the extent to which the… role-identity is part of the actor's self" (1985, p. 208). That is, what is the importance of this identity to the individual's overall sense of self? My expectation was that as exercise identity became more important to the individual's sense of self, relative to

other identities the individual might hold, it would have a greater effect on both self-presentation and behavior.

In considering how to measure exercise behavior, it seemed like two things were important: first, how much does the individual exercise? And second, how intensely do they exercise—i.e., what level of effort are they expending? I expected that identity and self-presentation could affect either, and likely both. As exercise identity becomes more salient, it seems reasonable that a person would exercise more—that is, more frequently and/or for a longer duration each session. It also seems reasonable that they might expend more effort during their exercise sessions. Similarly, as exercise self-presentation increases, I expected to see an increase in both volume and intensity of exercise. In other words, the more someone told the world, or at least their social circle, that they were an exerciser, the more they would feel compelled to exercise. Self-presentation should, theoretically, impact exercise volume; its impact on exercise intensity was a somewhat murkier proposition, but not a wholly unrealistic one.

Finally, there is the question of actual behavior vs. behavioral intention. The link between the two is well known and has been repeatedly demonstrated (see, e.g., Ajzen, 1991; Fishbein and Ajzen, 2009). In cross-sectional studies in particular, separating the two can be difficult. In the present study, for instance, I intended to include self-report of past behavior as an independent variable that could influence self-presentation, but use behavioral intention as a dependent variable that may be influenced by self-presentation. Exercise behavior was measured as described

above, with both volume and intensity measures. Exercise intention was measured as two variables: the likelihood of exercising in the next seven days, which was quite high among most participants, and the expected number of days that the participant would exercise in the next seven days. As outlined in the Analysis section to follow, the correlations between expected days of exercise and past days of exercise are quite high. Given this correlation and the high likelihood of exercise reported by most participants, I will make a case below that the behavioral measure alone is the correct focus for this study, with intention substantially redundant.

Research Questions

This study addresses the following broad research questions:

RQ 3.1: What is the nature of the relationship between exercise self-presentation and exercise behavior?

RQ 3.2: What role does exercise identity play in this relationship?

Methods

Participants

Participants (n=511) were recruited through Survey Sampling International (SSI) and were selected to be roughly equally distributed by age (18-24, 25-34, 35-45) and gender. (Quotas for this study were set such that distribution by age and gender was less rigid than in the prior studies, and not all age-gender quotas were filled.) All participants were at least occasional social media users. Of these, 27 participants (5.3%) were not current exercisers, another 80 (15.7%) exercised some but not

regularly, and the remaining 404 (79%) were regular exercisers (48% had been so for six months or longer). The recruitment for the survey specifically sought at least occasional exercisers, with the expectation that some non-exercisers would still apply to participate, and that infrequent exercisers would be a substantial minority of the sample. Among the exercisers, 8% exercised 1-2 times per week; 35%, 3-4 times per week; and 57%, 5 or more times per week.

Instrumentation

Demographic Information: Basic demographic information (age and gender) and exercise stage of change was collected for screening purposes. (The complete survey may be found in Appendix B.)

Exercise Identity: This was assessed using a nine-item scale that measures the relevance of exercise to the individual's concept of self (D. F. Anderson & Cychosz, 1994). Participants responded to the following items using a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7).

1. I consider myself an exerciser.
2. When I describe myself to others, I usually include my involvement in exercise.
3. I have numerous goals related to exercising.
4. Physical exercise is a central factor to my self-concept.
5. I need to exercise to feel good about myself.
6. Others see me as someone who exercises regularly.

7. For me, being an exerciser means more than just exercising.
8. I would feel a real loss if I were forced to give up exercising.
9. Exercising is something I think about often.

This scale has also been used by Karr et al. (2013) with high reliability and demonstrated positive correlations with behavior.

Identity Salience: Identity salience is the *relative importance* of a given role-identity in the hierarchy of all identities held by an individual—for example, racial, religious, professional, political, familial. Identity salience has been measured by asking participants to place identities in rank order (Callero, 1985). However, given the number of potential identities included in this study, such a task would be laborious and likely to produce data of questionable value. Instead, I elected to assess this by having participants indicate the importance of a number of identities they might hold, using a seven-point Likert scale to rate each identity individually. I could then assess the importance of exercise identity relative to the other identities.

Exercise Behavior: This was assessed by asking participants the frequency per week of exercise, the average minutes per exercise session, and their perceived exertion for a typical exercise session (measured on a 1-6 scale):

1. Not much different from other parts of my daily routine
2. Rarely or never sweat
3. Energetic but able to talk conversationally, rarely sweat

4. Energetic but able to talk, often sweat
5. Breathing heavily, sweating
6. Breathless, sweating

This intensity measure has been validated and used with the Exercise Identity Scale (D. F. Anderson et al., 1998).

Impression Motivation: Six items comprised the SPEQ-SM impression motivation (IM) subscale, as detailed in Study 1. The IM scale measures individuals' desires to influence how others perceive them, related to exercise.

Social Media Use: Participants were asked how many days they used each of the following types of social media, over the past seven days and in a typical week: Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube.

Impression Construction: Fifteen items comprised the SPEQ-SM impression construction (IC) subscale, as detailed in Study 1. The IC scale measures individuals' tendency to engage in exercise-related impression management tactics on social media.

Exercise Intention: Intention to exercise was assessed using two questions:

1. How likely are you to exercise in the next seven days?

   [7-point Likert scale ranging from highly unlikely (1) to highly likely (7)]

2. How many days do you intend to exercise out of the next seven days?

Fear of Negative Evaluation: This was measured using the abridged version of the Fear of Negative Evaluation Scale as described in Study 1.

At the conclusion of the survey, participants were asked to select from a list all types of exercise in which they typically engaged.

Procedures

Recruitment procedures and the survey instrument were approved by exemption prior to study commencement by the University of Pennsylvania Institutional Review Board. Participants recruited by SSI were directed to a survey hosted by Qualtrics. Age, gender, and exercise stage of change data were used to assign participants to quotas; once quotas were filled, potential respondents were redirected back to SSI. Otherwise, they were informed of the intent of the study and consent was collected electronically within the survey. Participants completed the survey as outlined above; data was collected November 10-13, 2015.

Analysis

Initial analysis included testing of the various measures; further analysis focused primarily on examining relationships between exercise self-presentation in social media, as measured by the SPEQ-SM, and other key variables in the theoretical model. All data manipulation and analyses were conducted using SPSS 22 (IBM Corp., 2013).

Prior to analyzing the data, several new variables were calculated for each participant. The following were all created as sums of the relevant scales:

- Total SPEQ-SM score, as well as scores for each of the two subscales (IM total and IC total)
- Fear of negative evaluation (FNE) score
- Exercise identity score

In addition, a score for exercise identity salience was calculated as the difference between the value assigned to identity as an exerciser and the average of the values assigned to all other potential identities. A positive value for this variable indicates that exercise identity contributes substantially to a participant's overall sense of self; higher numbers indicate a stronger contribution. An exercise volume variable was also calculated, as the product of typical days per week of exercise and average exercise session length in minutes.

Next, descriptive statistics were calculated for key variables. A correlation matrix was constructed for these variables, and linearity analysis was conducted using the means function in SPSS to determine if the correlations appropriately characterized the variable relationships. The reliability of the various scale measures—the SPEQ-SM and its two subscales, IM and IC; the Fear of Negative Evaluation Scale; and the Exercise Identity Scale—was assessed using inter-item correlations, with Cronbach's alpha as a measure of internal consistency. Exercise intention and exercise behavior measures were examined to determine if they measured distinct constructs; it was determined that using two behavioral

measures, volume and intensity, was preferable to maintaining intention as a separate measure. Similarly, the exercise identity and identity salience measures were tested for both discriminant validity and usefulness; salience was found to be problematic and was discarded from further analysis.

Once the foundational analyses were completed, relationships suggested by the theoretical model were examined in the following order:

1. The influence of exercise self-presentation (ESP) on behavior, over and above the effects of identity, was tested using regression analysis. Means plots were employed to examine possible curve shapes, and variable transformations suggested by the plots were performed prior to the regressions.
2. Identity was tested as a mediator of the influence of ESP on behavior using the Preacher and Hayes bootstrapping method.
3. Identity was tested as a moderator of the influence of ESP on behavior by adding interaction terms to the regressions conducted in step 1 above.
4. The influence of behavior on ESP, over and above the effects of identity, was examined by effectively reversing the direction of the analyses conducted in steps 1-3 above.
5. The influence of identity on ESP was tested using correlational analysis, and FNE was examined as a potential moderator of the relationship using regression.

Results

Descriptive Statistics

Descriptive statistics for key variables are shown in the table below. All variables with single indicators or summative scores showed the full range of possible responses, with means trending toward the higher end of the scales—to be expected with a sample comprised predominantly of regular exercisers.

Table 13: Key Variables Descriptive Statistics

Variable	Min	Max	Mean	SD
SPEQ-SM	21	126	76.76	25.30
IM subscale	6	36	27.36	6.05
IC subscale	15	90	49.40	21.70
Identity	9	63	47.24	10.01
Salience	-4.42	5.5	.76	1.34
Volume	0	1260	289.91	216.77
Intensity	1	6	4.10	1.19
FNE	7	35	19.60	8.71

Variable Correlations

Correlations between key variables are shown below. In order to ensure that relationships between variables were linear, and thus well captured by correlational analysis, relationships of interest were tested for nonlinearity using the means function in SPSS. The majority of relationships did not show sizable or significant deviation from linearity. However, the relationships between identity salience and the SPEQ-SM measures, as well as identity and salience, appeared to be non-linear. (Linearity test statistics are available in Appendix C, and additional analyses of non-linear relationships appear in the following sections.)

Table 14: Key Variables Correlation Matrix

	SPEQ-SM	IM	IC	Identity	Salience	Volume	Intensity	FNE
SPEQ-SM	1.00							
IM subscale	.672***	1.00						
IC subscale	.978***	.504***	1.00					
Identity	.549***	.616***	.468***	1.00				
Salience	-.123‡	.060‡	-.160‡	.257‡	1.00			
Volume	.245‡	.204‡	.229‡	.408***	.137**	1.00		
Intensity	.091*	.222***	.044	.320***	.203***	.164***	1.00	
FNE	.268***	.265***	.239***	.051	-.185***	-.028	-.002	1.00

*p<.05, **p<.01, ***p<.001, ‡non-linear relationship

Testing the Measures

To demonstrate the reliability of the SPEQ-SM with this new sample, inter-item correlations were calculated. As in Study 1, the subscales demonstrated good convergent validity. Among the IM items, the mean correlation was .644 with an alpha of .916. Among the IC items, the mean correlation was .729 with an alpha of .976. The mean correlation was .567 for the SPEQ-SM as a whole, and Cronbach's alpha was .965. The abbreviated FNE scale was again shown to be a valid measure, with a mean inter-item correlation of .753 and alpha of .955. The Exercise Identity Scale, a validated measure not used in the previous studies in this dissertation, had a mean inter-item correlation of .520 and an alpha of .906. Based on these statistics, all of the scale measures used in this study were deemed to be good measures.

Exercise Intention and Behavior

Given the close correlation between intention and behavior, as well as the cross-sectional nature of this study, some analysis was conducted to determine if the two constructs should be kept separate for future analyses, or if measures of past behavior would be sufficient as outcome measures for the purposes of this study.

The two constructs had a common measure (days of exercise in a week), as well as distinct measures (minutes and intensity of exercise for behavior, and likelihood of exercise for intention). First, the days of exercise correlation was examined. There was a correlation of .769 ($p<.001$) between intended days of exercise and days of exercise in the previous week. There was a correlation of .788 ($p<.001$) between intended days of exercise and days of exercise in a typical week. A paired samples t-test revealed a statistically significant difference between days of exercise last week and intended days of exercise ($\Delta\mu=.399$, $p<.001$), as well as between days of exercise in a typical week and intended days of exercise ($\Delta\mu=.155$, $p<.001$). In both cases, intended days of exercise was slightly higher than reported days of exercise. Given the small magnitude of the difference, and the general tendency of intentions to be optimistic, it seems reasonable based on these findings to simply use past behavior as the behavioral measure for analysis.

But what of the remaining behavioral and intention measures? Likelihood of exercising in the next seven days was significantly positively skewed, with 79% of respondents choosing 6 or 7 on a 7-point scale from highly unlikely (1) to highly likely (7), and another 13% choosing 5. With 92% of participants indicating that they were more likely to exercise than not, the utility of this measure is relatively low. The average minutes per exercise session behavioral measure did not have an equivalent intention measure, but given the high correlation between past days and intended days, it seems reasonable to expect that past session duration would correlate with future session duration. Likewise, there was no intensity measure for

exercise intention, but past intensity could reasonably be expected to correlate with future intensity. There is, after all, a reason we refer to an exercise *routine*. Therefore, a decision was made to proceed with analysis using the volume (past days * past minutes) and intensity variables for all analyses involving exercise behavior.

Identity and Identity Salience

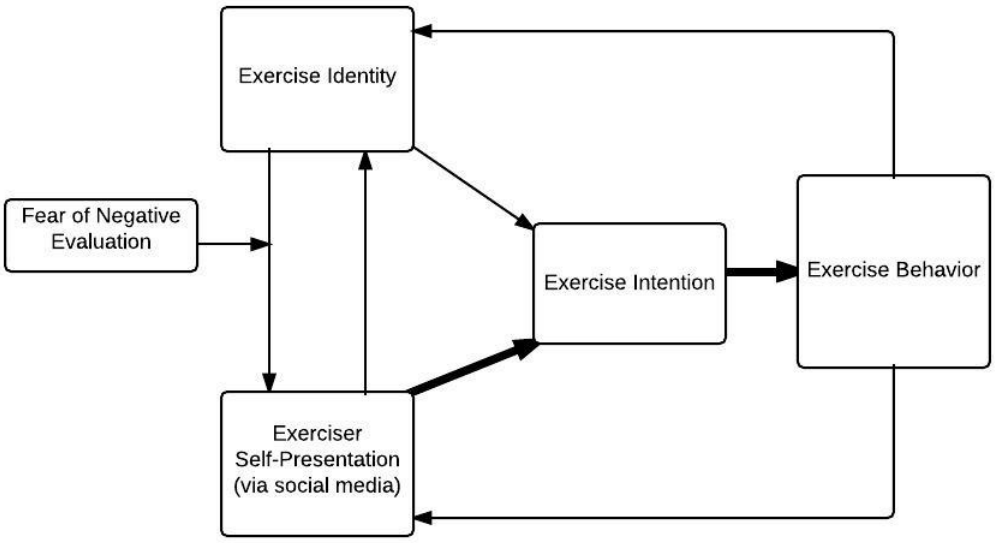
Next, analysis was conducted to determine if the exercise identity and identity salience variables were indeed measuring distinct constructs—and also to examine the relationship between the two. The identity scale should be measuring the presence of identity as an exerciser, and the salience measure should be a gauge of how important that identity is to the individual as compared to other identities held. Exercise identity was measured using a 9-item scale, with ratings from 1-7, giving a possible minimum value of 9 and maximum value of 63. The mean score on this measure was 47.24 (SD=10.01); most participants identified as exercisers.

Looking at the raw ratings on the salience measure, exerciser identity was particularly important among study participants, ranking second overall, behind only familial identities (e.g., identity as a father, mother, or sibling). There was a positive linear relationship between the measure of a participant's exercise identity and the importance assigned to that identity by the participant, as would be expected. However, the raw rating was intended to be used not on its own, but in comparison to other identities. The relationship between identity and salience—that is, between exercise identity and its *relative* importance, showed strong

evidence of non-linearity. In order to explore other forms of relationships between identity and salience, the curve estimation function in SPSS was employed. Logarithmic, quadratic, cubic, exponential, and logistic transformations were explored, but the R^2 for these curves was not notably different from the linear regression R^2. The relative measure of salience had not previously been validated, and this analysis suggests that it was not a particularly good measure. If it was actually a meaningful variable to include and was measured appropriately, a positive, interpretable relationship between identity and salience should have emerged. Therefore, salience was dropped from further analyses.

Influence of Exerciser Self-Presentation on Exercise Behavior

Figure 6: Self-Presentation Influence on Exercise Behavior



Because the cross-sectional nature of this study makes direction of causality impossible to discern without instrumental variables, and because the theoretical model proposes bidirectional influence, analysis was conducted to explore effects

along both possible causal paths between self-presentation and behavior. Of primary interest in this analysis was whether exerciser self-presentation influenced exercise behavior, over and above the effects of identity. The relationship between self-presentation and exercise volume showed significant deviation from linearity, so means plots were constructed to examine curve shapes. System-calculated cut points were used to divide total SPEQ-SM score, IM subscale score, and IC subscale score into five equal categories, and then the mean of each category was assigned as the value for this new categorical variable. Mean exercise volume was then calculated for each SPEQ-SM, IM, and IC category. These were graphed to produce curves that estimate the relationship between the self-presentation measures and exercise volume (see Appendix C). The curves suggested a quadratic transformation of the independent variables; regression equations with these transformations are shown in the table below. The predictive power of all three self-presentation measures was improved by the addition of the quadratic term, and the equation with the SPEQ-SM score explained more variance in exercise volume than the equations using either of the individual subscales.

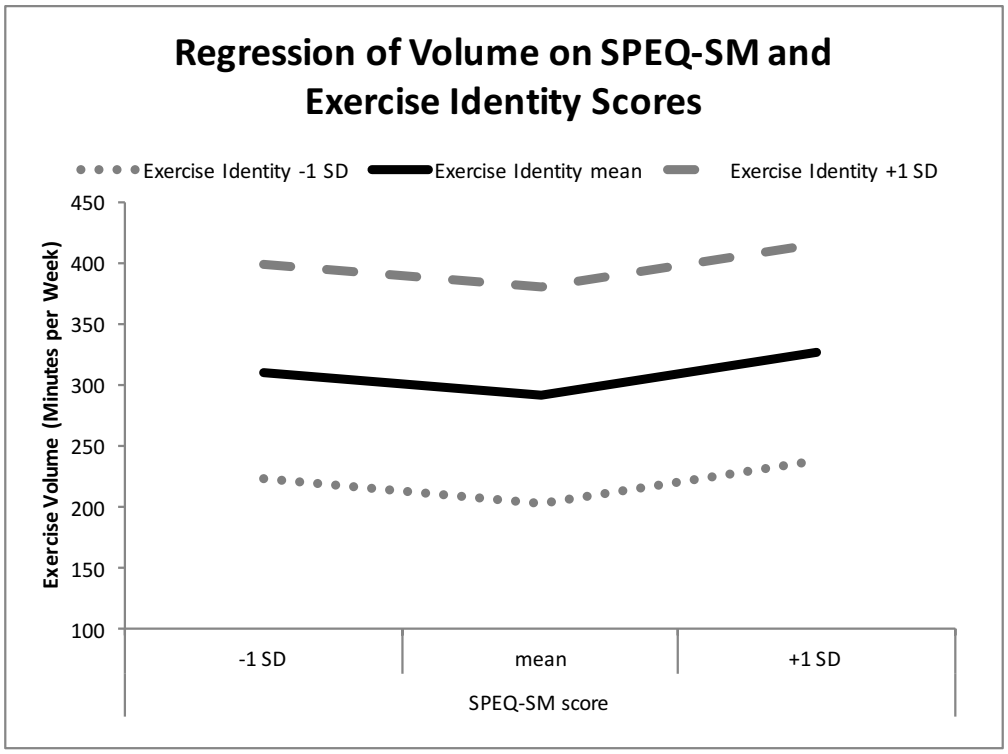
Table 15: Regressions of Exercise Volume on SPEQ-SM and Subscale Scores

Self-Presentation	R^2	p
Volume = 129 + 2.099 SPEQ-SM + ε	.060	<.001
Volume = 390 – 5.565 SPEQ-SM + .05 SPEQ-SM^2 + ε	.086	<.001
Impression Motivation		
Volume = 89 + 7.327 IM + ε	.042	<.001
Volume = 490 – 27.528 IM + .705 IM^2 + ε	.074	<.001
Impression Construction		
Volume = 177 + 2.283 IC + ε	.052	<.001
Volume = 331 – 5.36 IC + .077 IC^2 + ε	.078	<.001

Next, the identity measure was added to the equation with the quadratic SPEQ-SM term to determine if exercise self-presentation affects exercise volume over and beyond the effects of identity. All terms in the resulting regression equation were significant ($p<.01$). The amount of variance explained ($R^2=.185$, $p<.001$) increased over that explained by the regression of volume on identity alone ($R^2=.166$, $p<.001$), indicating that self-presentation has a unique effect on exercise volume. The graph below shows the shape of the relationship, using values of the predictor variables at the mean of each, as well as one standard deviation above and below the mean. The effect of self-presentation on volume appears to increase as scores move away from the mean in either direction.

$$\text{Volume} = 98 - 6.127\ \text{SPEQ-SM} + .042\ \text{SPEQ-SM}^2 + 8.815\ \text{ExID} + \varepsilon$$

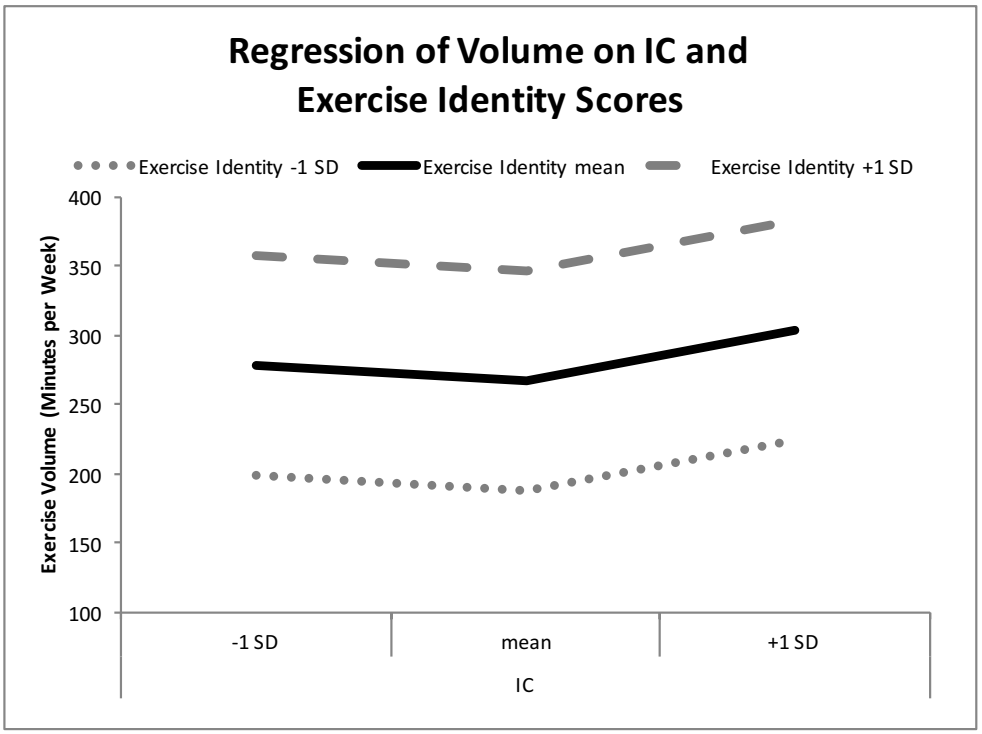
Figure 7: Quadratic Effect of Self-Presentation on Exercise Volume



The analysis above was then repeated with the IC measure alone, in order to zero in on the effects of social media impression construction techniques. The identity measure was added to the equation with the quadratic IC term to determine if impression construction itself affects exercise volume over and beyond the effects of identity. With ΔR^2=.013 (compared to the regression of volume on identity alone), impression construction was shown to have a unique effect on exercise volume. An approximation of the relationship shape is shown below. As with the holistic SPEQ-SM measure, the effect of impression construction on volume appears to increase as scores move away from the mean in either direction.

$$\text{Volume} = -10.811 - 4.448\,\text{IC} + .051\,\text{IC}^2 + 7.9\,\text{ExID} + \varepsilon$$

Figure 8: Quadratic Effect of Impression Construction on Exercise Volume



Of the self-presentation measures, only IM appeared to be correlated with exercise intensity. Means plotting as described above again suggested a quadratic or possibly cubic transformation of the independent variable. The cubic transformation resulted in a non-significant regression; other regression equations are shown below.

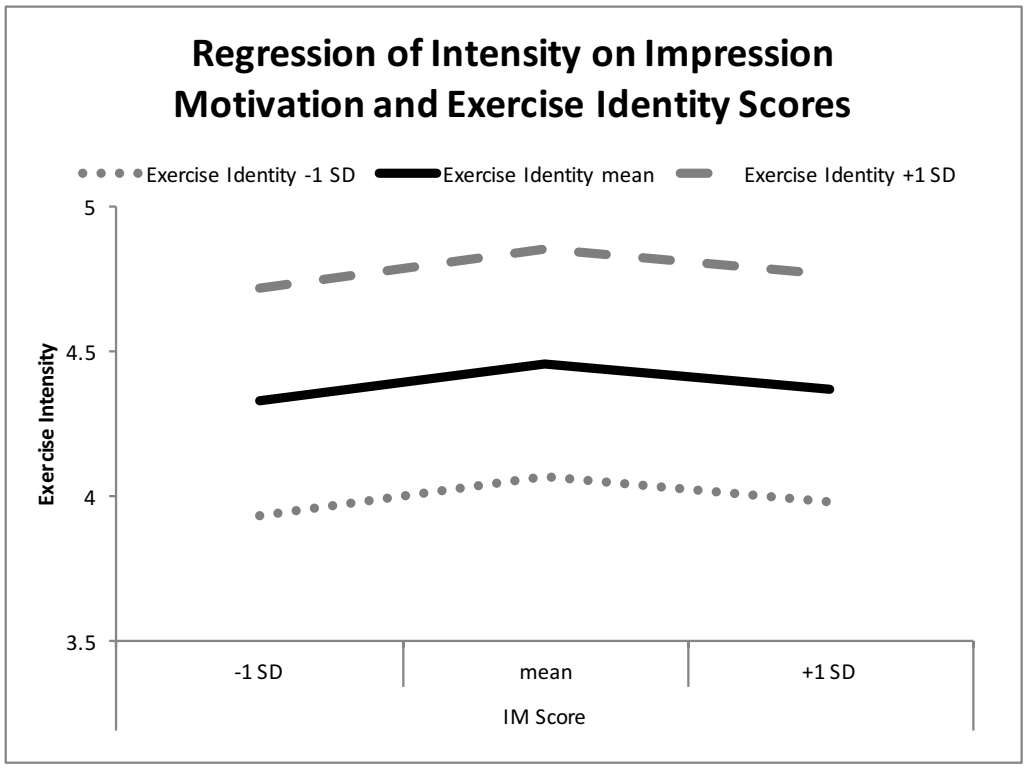
Table 16: Regressions of Exercise Intensity on Impression Motivation

Impression Motivation	R^2	p
Intensity = 2.9 + .044 IM + ε	.050	<.001
Intensity = 1.5 + .162 IM - .002 IM^2 + ε	.062	<.001

The identity measure was then added to the quadratic equation to determine if IM affected exercise intensity over and beyond the effects of identity. All terms in the resulting regression equation were significant ($p<.001$). The amount of variance explained ($R^2=.126$, $p<.001$) increased over that explained by the regression of intensity on identity alone ($R^2=.102$, $p<.001$), indicating that impression motivation has a unique effect on exercise intensity. The graph below appears to show an effect opposite of that shown in the previous graph for volume; the influence of impression motivation on intensity is highest at the mean, and decreases slightly at higher and lower values of the IM score.

$$\text{Intensity} = .265 + .168\ IM - .003\ IM^2 + .039\ ExID + \varepsilon$$

Figure 9: Quadratic Effect of IM on Exercise Intensity

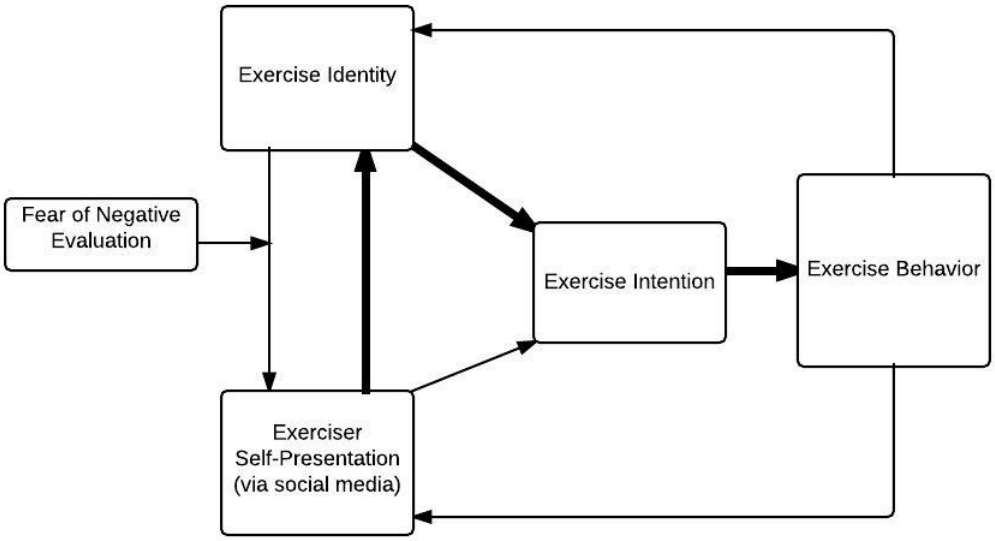


Although IC did not appear to be correlated with intensity on its own, when identity was added to the regression, IC had a very small but statistically significant effect on intensity, but in the opposite direction expected. This effect is best characterized by the equation below (R^2=.117).

$$\text{Intensity} = 2.31 - .007\ \text{IC} + .046\ \text{Identity} + \varepsilon$$

Mediation Analysis

Figure 10: Identity Mediating the Influence of Self-Presentation on Behavior



Identity was also tested as a mediator of the effects of self-presentation on exercise behavior. Due to the non-normality of the data, bootstrapping was a better approach than using the Sobel test. This was accomplished using the MEDCURVE SPSS macro (Hayes & Preacher, 2010). Volume was entered as the dependent variable, SPEQ-SM score as the independent variable, and exercise identity score as the mediator. The effect of SPEQ-SM was specified as quadratic based on the analysis above. The relationships between presentation and identity and between identity and volume were specified as linear. Based on bias-corrected 95% confidence intervals and 1,000 bootstrap samples, there was an instantaneous indirect effect of self-presentation on volume through identity (θ=1.7796). Identity appears to partially mediate the relationship between self-presentation and exercise volume. Rerunning the analysis with IC as the independent variable, an indirect effect of IC on volume

through identity was detected (θ=1.7076); identity partially mediates the influence of impression construction on exercise volume. A similar analysis was then run using exercise intensity as the dependent variable and impression motivation as the independent variable. There was a small but statistically significant indirect effect of IM on intensity through identity (θ=.0398).

Moderation Analysis

Finally, identity was tested as a potential moderator of the effect of self-presentation on behavior, by entering it as an interaction term in the regression analyses, first with SPEQ-SM and volume, then IC and volume, and finally with IM and intensity. For the volume regressions, the interaction terms were significant prior to the addition of the quadratic terms, but non-significant once the quadratic terms were added. For the intensity regression, the interaction term was highly significant in both the linear and quadratic regressions; the quadratic term itself was non-significant. Coefficients and significance data are shown below for selected regressions; see Appendix C for complete tables of coefficients and significance for all regressions in this analysis.

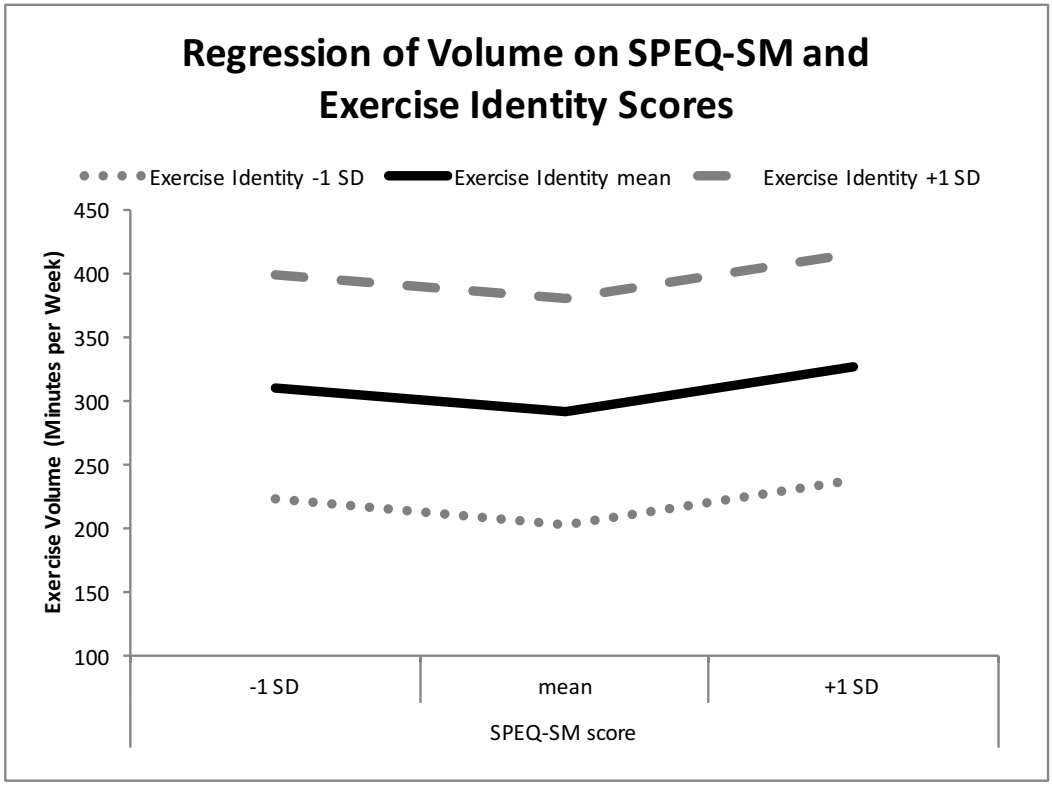
Table 17: Moderation Analysis Regression Coefficients and Significance (Exercise as DV)

Dependent Variable	Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE				
Exercise Volume	SPEQ-SM	-3.332	1.625	-.389	-2.050	.041	.175
	ExID	3.653	2.352	.169	1.553	.121	
	SPEQ-SM*ExID	.072	.031	.580	2.284	.023	
Exercise Volume	SPEQ-SM	-6.114	1.976	-.713	-3.095	.002	.185
	ExID	8.296	3.011	.383	2.755	.006	
	SPEQ-SM*ExID	-.002	.043	-.014	-.039	.969	
	$SPEQ\text{-}SM^2$	.043	.017	.773	2.451	.015	
Exercise Volume	IC	-3.793	2.030	-.380	-1.869	.062	.176
	ExID	4.698	1.952	.217	2.406	.016	
	IC*ExID	.085	.039	.535	2.161	.031	
Exercise Volume	IC	-5.378	2.245	-.538	-2.395	.017	.180
	ExID	6.248	2.166	.289	2.884	.004	
	IC*ExID	.041	.048	.258	.860	.390	
	IC^2	.039	.024	.396	1.638	.102	
Exercise Intensity	IM	.153	.030	.776	5.128	.000	.148
	ExID	.117	.017	.981	6.890	.000	
	IM*ExID	-.003	.001	-1.295	-5.175	.000	
Exercise Intensity	IM	.146	.045	.738	3.235	.001	.149
	ExID	.120	.023	1.010	5.177	.000	
	IM*ExID	-.003	.001	-1.355	-3.635	.000	
	IM^2	.000	.001	.074	.218	.828	

Comparing the R^2 for the moderation regressions with the R^2 for the original quadratic regressions, the best models to explain the effects of self-presentation on exercise behavior, using the available data, are shown below. In all equations, a portion of the effect of the self-presentation variable on the behavior variable is mediated through identity.

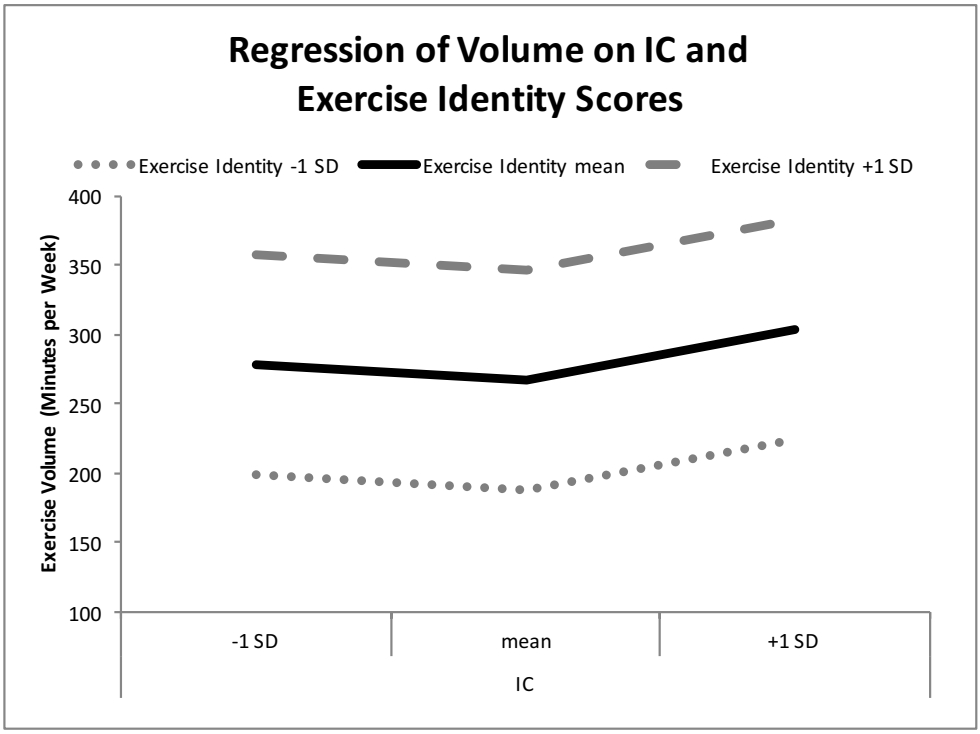
$$\text{Volume} = 98 - 6.127\ \text{SPEQ-SM} + .042\ \text{SPEQ-SM}^2 + 8.815\ \text{ExID} + \varepsilon \quad (R^2=.185)$$

Figure 11: Quadratic Effect of SPEQ-SM on Exercise Volume



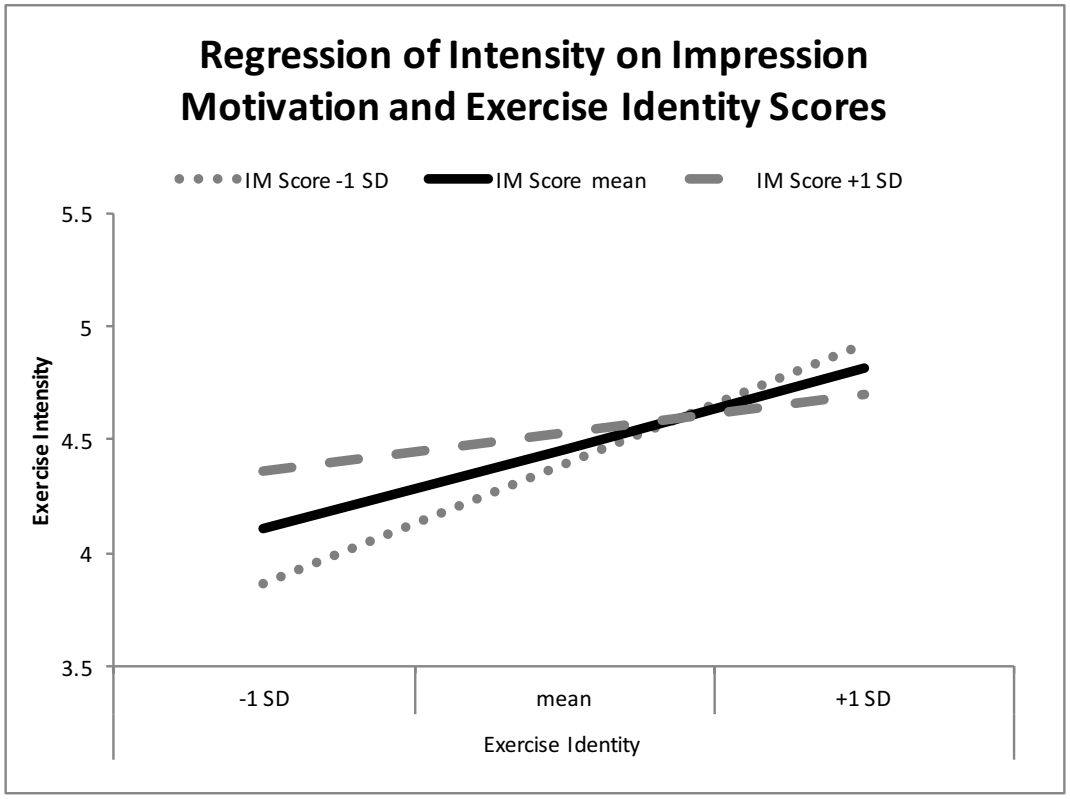
$$\text{Volume} = -10.811 - 4.448\,\text{IC} + .051\,\text{IC}^2 + 7.9\,\text{ExID} + \varepsilon \quad (R^2 = .179)$$

Figure 12: Quadratic Effect of Impression Construction on Exercise Volume



$$\text{Intensity} = -1.375 + .153\ \text{IM} + .117\ \text{ExID} - .003\ \text{IM*ExID} + \varepsilon \quad (R^2 = .148)$$

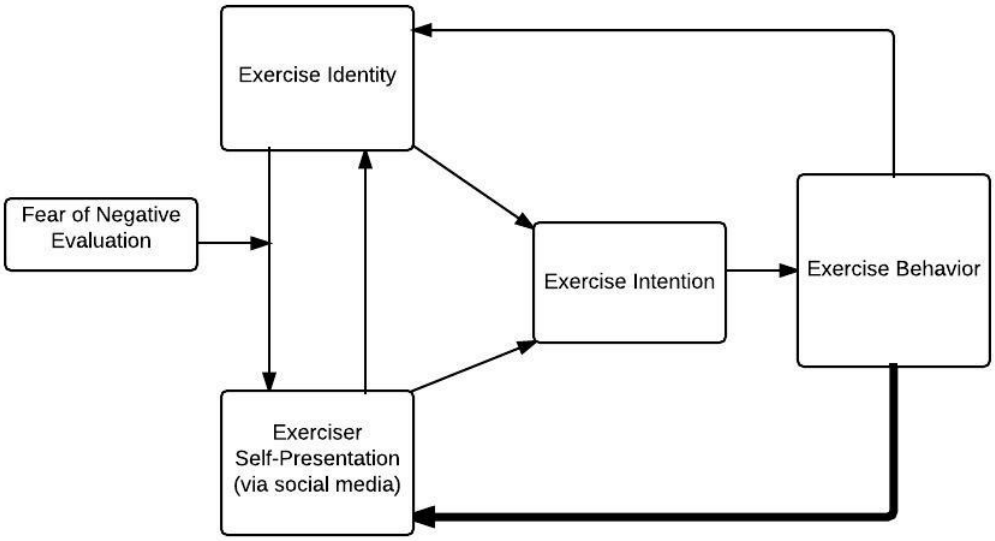
Figure 13: Interaction Effects of IM and Identity on Exercise Intensity



At lower levels of exercise identity, a higher IM score is associated with greater exercise intensity. But at higher levels of exercise identity—slightly higher than the mean—this effect reverses, such that lower IM scores are associated with greater exercise intensity.

Influence of Behavior on Exercise Self-Presentation

Figure 14: Influence of Exercise Behavior on Self-Presentation



Because the direction of influence is posited to run not just from self-presentation to behavior, but also from behavior to self-presentation, complementary analyses were conducted to examine the relationship in the latter direction. A quadratic transformation appeared to provide the best fitting model for the effect of behavior (operationalized as volume) on self-presentation, but the effect of the squared volume term was so miniscule (B=-0.00002707) that it did not warrant inclusion. Instead, the linear regression model was more appropriate. The model using the holistic SPEQ-SM score fit the data better than that using just the IC subscale, but statistically significant effects of volume on IC alone were detected. In both cases, volume was no longer significant when identity was added to the model, but regained significance with the addition of an interaction term, indicating that

exercise volume has an effect on self-presentation both over and beyond the effect of identity and as moderated by identity.

Table 18: Regressions of Self-Presentation on Exercise Volume – Coefficients and Significance

Dependent Variable	Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
SPEQ-SM	Volume	.029	.005	.245	5.701	.000	.060
SPEQ-SM	Volume	.003	.005	.025	.622	.534	.302
	ExID	1.361	.103	.539	13.278	.000	
SPEQ-SM	Volume	-.049	.023	-.420	-2.139	.033	.309
	ExID	1.141	.140	.451	8.166	.000	
	Volume*ExID	.001	.000	.495	2.318	.021	
IC	Volume	.023	.004	.229	5.297	.000	.052
IC	Volume	.005	.004	.045	1.051	.294	.221
	ExID	.975	.093	.450	10.495	.000	
IC	Volume	-.041	.021	-.408	-1.969	.050	.229
	ExID	.782	.127	.361	6.177	.000	
	Volume*ExID	.001	.000	.504	2.234	.026	

Exercise intensity was also examined as a potential influence on self-presentation. Based on the model R^2, the effect of exercise intensity on self-presentation was best characterized by a linear equation with impression motivation as the key self-presentation measure and intensity, identity, and an intensity-identity interaction term as predictor variables. However, there was a direct, unique effect of intensity on both impression construction and on the holistic SPEQ-SM score when identity was also included in the regression as a predictor—but the effect was opposite the direction expected. The best model for each dependent variable is shown in bold in the table below.

Table 19: Regressions of Self-Presentation on Exercise Intensity – Coefficients and Significance

Dependent Variable	Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
SPEQ-SM	Intensity	1.929	.935	.091	2.062	.040	.008
SPEQ-SM	**Intensity**	**-2.002**	**.825**	**-.094**	**-2.428**	**.016**	**.310**
	ExID	**1.464**	**.098**	**.579**	**14.892**	**.000**	
SPEQ-SM	Intensity	-.611	3.019	-.029	-.202	.840	.310
	ExID	1.573	.247	.623	6.358	.000	
	Intensity*ExID	-.030	.062	-.091	-.479	.632	
IC	Intensity	.801	.805	.044	.995	.320	.002
IC	**Intensity**	**-2.144**	**.746**	**-.118**	**-2.874**	**.004**	**.232**
	ExID	**1.097**	**.089**	**.506**	**12.333**	**.000**	
IC	Intensity	-2.932	2.732	-.161	-1.073	.284	.232
	ExID	1.035	.224	.478	4.625	.000	
	Intensity*ExID	.017	.057	.060	.300	.764	
IM	Intensity	1.128	.219	.222	5.149	.000	.050
IM	Intensity	.142	.187	.028	.762	.446	.381
	ExID	.367	.022	.607	16.479	.000	
IM	**Intensity**	**2.322**	**.677**	**.458**	**3.431**	**.001**	**.394**
	ExID	**.537**	**.055**	**.889**	**9.692**	**.000**	
	Intensity*ExID	**-.047**	**.014**	**-.596**	**-3.349**	**.001**	

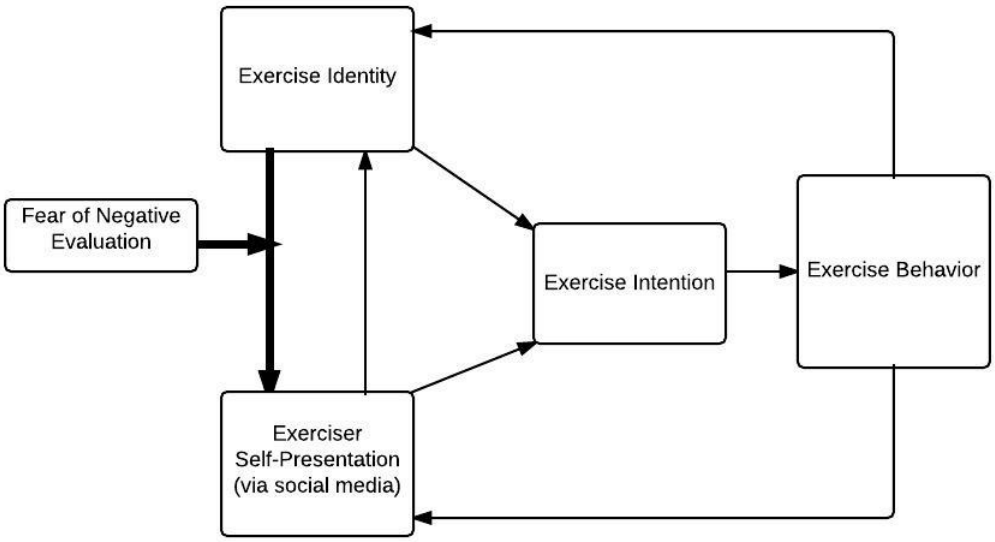
Mediation Analysis

To test whether identity also mediates the effect of exercise behavior on self-presentation, mediation analysis was conducted for both the effects of volume on self-presentation and the effects of intensity on impression motivation. Using the MEDCURVE SPSS macro (Hayes & Preacher, 2010), SPEQ-SM score was entered as the dependent variable, exercise volume as the independent variable, and exercise identity score as the mediator. The effect of volume was specified as quadratic based on the analysis above. The relationships between presentation and identity and between identity and volume were specified as linear. Using bias-corrected 95% confidence intervals and 1,000 bootstrap samples, a small but significant indirect effect of volume on self-presentation (as measured by the SPEQ-SM) through

identity was found (θ=.0258). Using just the IC measure as the dependent variable, a small but highly significant indirect effect was again detected (θ=.0185). A similar analysis was run using impression motivation as the dependent variable and exercise intensity as the independent variable, with all relationships specified as linear. There was a significant indirect effect of intensity on IM through identity (θ=.9853).

Influence of Identity on Exercise Self-Presentation

Figure 15: Influence of Identity on Exercise Self-Presentation



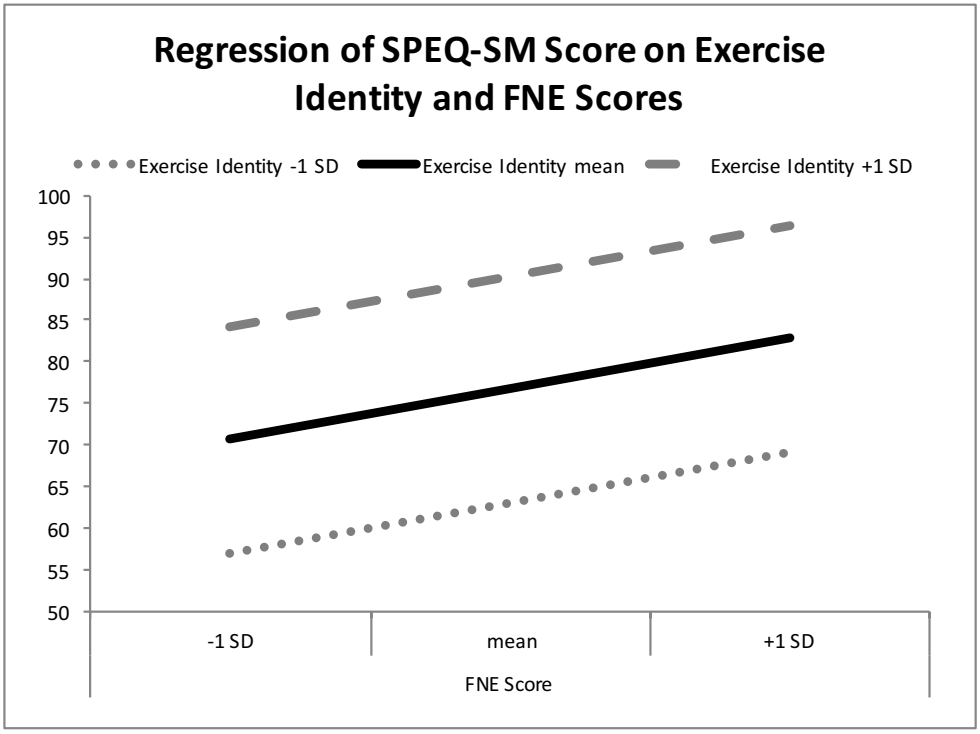
There was a moderately strong, highly significant correlation (r=.549, p<.001) between exercise self-presentation in social media (as indicated by total SPEQ-SM score) and exercise identity. The correlation was stronger when testing just the impression motivation subscale (r=.616, p<.001), and weaker when testing just the impression construction subscale (r=.468, p<.001).

Fear of negative evaluation (FNE) was examined as a moderator of the relationship between exercise identity and exercise self-presentation using a three-step regression analysis. In the first step, the SPEQ-SM score was entered as the independent variable, with exercise identity as the dependent variable. (Although the theoretical model postulates bidirectional influence between these two variables, only this direction of influence was hypothesized to be moderated.) The relationship was, as indicated by the correlation analysis, highly significant (R^2=.302, p<.001). In step two, FNE was entered as an additional predictor variable; both predictor variables were highly significant (p<.001), and the proportion of variance explained by the model increased (R^2=.359, p<.001). In the third and final step, an interaction term between exercise identity and FNE was introduced. The interaction term in the third step was not significant. Thus, fear of negative evaluation was ruled out as a moderator.

The best model for the influence of identity on self-presentation, using the existing data, is shown below.

$$\text{SPEQ-SM} = -1 + 1.356\ \text{ExID} + .699\ \text{FNE} + \varepsilon$$

Figure 16: Linear Effect of Identity and FNE on Self-presentation



Discussion

The purpose of this study was to demonstrate the usefulness of the SPEQ-SM, going a step beyond simply measuring exercise self-presentation on social media to functioning as a predictor of exercise behavior. Analysis addressed pathways of influence from self-presentation to behavior, and from behavior and identity to self-presentation. Because this was a cross-sectional study, causal claims cannot be made; however, my findings provide some initial support for the theorized relationships between variables. In the subsequent discussion, I use the term "effect" to signal the direction of effects being explored, but always remain aware of the limitations of any claims.

There was a small but significant effect of self-presentation on exercise volume when controlling for exercise identity; identity partially mediated this relationship. Both unusually high and low self-presentation scores (those at one standard deviation above or below the mean) were associated with increased exercise volume, while scores at the mean were associated with a slight decrease in volume. Based on the theoretical model, the association of higher SPEQ-SM scores with greater exercise volume makes sense. That lower SPEQ-SM scores would also predict an increase in volume was surprising. Perhaps these individuals are trading social media time for gym time?

Impression construction did not appear to be correlated with exercise intensity, but when controlling for identity, a negative relationship emerged between IC and intensity. The negative effect of IC on intensity was very small, but

statistically significant. However, the effect size was markedly increased when the direction of analysis was reversed (i.e., examining the effect of intensity on IC). I expected to see a positive relationship between IC and intensity—as individuals participate in more intense workouts, their social media activity should reflect this increased investment in exercise. It's possible that the intrinsic satisfaction of a hard workout reduces the motivation to engage in IC, because the exerciser is less likely to look for positive feedback externally. However, an increase in intensity predicted an increase in IM—which theoretically drives IC activity. This latter finding makes the observed IC-intensity relationship particularly difficult to explain.

There was also a small but significant effect of the impression motivation component of self-presentation on exercise intensity; identity was a partial mediator as well as a moderator of this relationship. At lower levels of exercise identity, higher IM scores were associated with greater exercise intensity, while at higher levels of exercise identity, lower IM scores were associated with greater intensity. In other words, when exercise identity is not very strong, impression motivation appears to have a positive effect on exercise intensity. As exercise identity strengthens, the effect of IM on intensity diminishes, to the point that, at high levels of exercise identity, lower impression motivation actually predicts higher exercise intensity.

Together, these findings suggest that exercise self-presentation in social media may influence exercise behavior—in certain circumstances (e.g., weaker exercise identity). The data are consistent with effects in either or both directions,

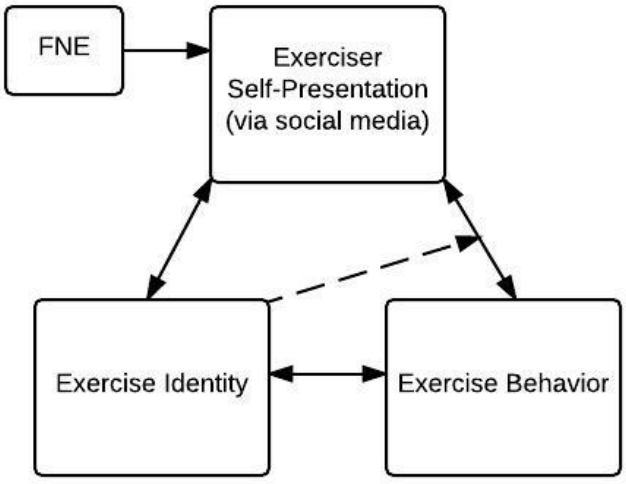
potentially supporting the hypothesis of reciprocal influence between these variables. (Of course, actual effect direction is impossible to discern with only cross-sectional data, and observed effects may also be the result of an unmeasured confounding variable.) Both exercise identity and exercise behavior are directly associated with self-presentation; there is evidence that exercise volume also has a small indirect effect on self-presentation, mediated by identity. Further, there is evidence that volume and identity interact in their effects on self-presentation. Similarly, intensity and identity appear to interact in their effects on impression motivation (which helps drive impression construction), and identity partially mediates the effect of intensity as well.

Fear of negative evaluation emerged not as a moderator of the identity-presentation relationship, but as an independent influence on exerciser self-presentation. When individuals seek positive evaluations, they may be motivated to present aspects of themselves that are generally looked upon favorably. Health consciousness and engagement in physical activity are often seen as very good things; these could be used to promote positive rather than negative evaluations by others viewing one's social media profile. This may be the driving factor behind the somewhat small but significant positive correlation between FNE and self-presentation. If that is the case, it appears to happen independently of exercise identity.

Though these findings are preliminary at best, and certainly merit further study, they are encouraging. The model R^2 for the paths into self-presentation were

higher than the R^2 for the paths out of self-presentation. In other words, the amount of variance in self-presentation explained by exercise behavior and exerciser identity was higher than the amount of variance in behavior explained by self-presentation. Still, based on the models, the direct effect of self-presentation accounted for about 6% of the variance in exercise intensity and about 9% of the variance in exercise volume (8% of which is attributable to impression construction activity). With identity added to the model so that the indirect and moderated effects of self-presentation were captured, the percent of variance in behavior explained by the models rose to 15-19%. The data from this study are consistent with a revised theoretical model like the one below.

Figure 17: Revised Theoretical Model



Given such a model, it seems reasonable to expect that an increase in any one of the three key variables would lead, either directly or indirectly, to an increase in the other two. It is likely that the model would reach equilibrium at some point, but until that occurs, we might see a cycle of incremental increases among the three variables. Based on this, if we want to encourage individuals to become more active, we might first look to influence their self-presentation as exercisers in social media, with the expectation that this would positively influence behavior and identity, leading to increased self-presentation as an exerciser, and so on—potentially creating something of an echo chamber effect.

Strengths of this study include its reasonably large and diverse sample and its use of validated instruments, both the newly validated SPEQ-SM as well as supporting instruments including the Fear of Negative Evaluation Scale, the Exercise Identity Scale, and behavioral measures. A major limitation of the study is its cross-sectional design. It is possible that, given more time and resources to conduct a longitudinal study, a stronger case could be made for the influence of self-presentation on exercise behavior, with self-presentation at baseline predicting behavior at follow-up. Another limitation is the non-recursive nature of the theoretical model, which makes isolating the effects of different variables difficult, if not impossible. Doing so would require identifying additional instrumental variables to serve as exclusive indicators for the various model constructs. This is, perhaps, a logical next step in continuing this line of research. Finally, only a small proportion (8%) of study participants who were exercisers reported exercising 1-2

times per week. It is possible that exerciser self-presentation in social media has a greater effect on individuals who exercise less frequently, and that increased exercise-related social media activity could help them move from exercising 1-2 times per week to exercising more frequently. In order to determine this, additional work should be undertaken with a focus on this population.

Conclusion

The three studies comprising this dissertation were intended as an initial foray into establishing the utility of social media for the development and maintenance of healthy exercise behaviors. My goal was to create and validate an instrument to measure exercise self-presentation in social media; to use the instrument to assess self-presentation among a sample of exercisers; and, finally, to demonstrate a relationship between self-presentation, as measured by the instrument, and exercise behavior. I believe that the work presented herein achieves these goals, but also points to the need for ongoing research before I can make a conclusive argument in favor of encouraging exercise self-presentation in social media as a means to influencing exercise behavior. Studies 1 and 3 demonstrated that the SPEQ-SM is a good gauge of exercise self-presentation in the social media environment; studies 2 and 3 revealed that this behavior is prevalent among exercisers. Study 3 also explored links between self-presentation behavior, exercise behavior, and exercise identity; the findings therein were encouraging, but represent a starting point more than an end point.

Interviews with CrossFit athletes and coaches helped lay the groundwork for Study 1—and, essentially, for the entire project. These, coupled with content analysis of social media profiles and fitness websites, provided a good overview of the types of exercise-related content that individuals generate and consume, as well as shedding light on their motivations for creating and engaging with such content. Using Conroy et al.'s 2000 SPEQ instrument as a starting point, this preliminary

work suggested the retention of their impression motivation (IM) subscale as it was written and validated, and enabled me to retool their impression construction (IC) subscale to update it for a world in which social media plays a major role in social interaction and identity work. This new social media-based IC scale is perhaps the strongest contribution my dissertation makes to the literature. I validated this revised instrument in several ways. First, convergent and discriminant validity were assessed by analyzing inter-item and item-total correlations for the IM and IC subscales, with Cronbach's alpha employed as a measure of the overall reliability of the scales. Correlations and alphas were well within acceptable ranges. Next, factor analysis was conducted; this supported the two subscales as measuring two distinct constructs. Nomological validity was established by calculating correlations between the subscale scores and scores on related measures: fear of negative evaluation, exercise causality orientation, and social media use. Correlations were found between impression motivation and fear of negative evaluation, and between impression construction and a control orientation (an orientation in which individuals tend to rely on threats, inducements, and expectations—either real or imagined—to motivate themselves). IC and social media use were also correlated, which makes sense; one must use social media in order to engage in IC activities within it.

Study 2 employed the newly validated SPEQ-SM to examine rates of exercise-related impression motivation and impression construction in a sample made up predominantly of regular exercisers. In addition, it explored the mechanisms

through which social media content about exercise might motivate the individuals posting and viewing such content. The vast majority of exercisers in the study (93%) were at least somewhat motivated toward exercise-related impression management; slightly more than half (52%) were moderately or strongly motivated. Most participants (85%) engaged in at least one impression construction activity. For those with moderate to high IM, the mean number of IC activities was 10.5; for those with lower IM, it was 6.6. With the exception of posting videos of workouts and sports activity, at least half of participants said they engaged in each of the 15 IC activities. All six motivational mechanisms explored showed high correlations with IC, and high levels of agreement by participants (64-79%). Thus, Study 2 provided a good understanding of the incidence of exercise-related self-presentation activities in social media, as well as the motivations behind them, among these exercisers.

The next step was to tie exerciser self-presentation in social media to exercise behavior. This was the goal of Study 3. Again, the sample was mostly made up of regular exercisers, and more than half (57%) of them claimed to work out five or more times per week. The SPEQ-SM was again shown to be a good measure with this new sample, using tests of convergent and discriminant validity as described above. Exerciser self-presentation was shown to be correlated with exercise volume; the SPEQ-SM and each of the two subscales, IM and IC, showed a small but highly significant positive association with volume, which was strengthened with the addition of quadratic transformations of the self-presentation variables. (As in the previous chapter, I will sometimes use the term “effect” in the following

discussion to signal the direction of associations being explored, while acknowledging my inability to make causal claims due to the cross-sectional nature of the study.) However, identity explained far more of the variance in exercise volume than did self-presentation, though self-presentation did account for some variance in volume over and above the effects of identity. Participants with SPEQ-SM and IC scores near the mean appeared to have the lowest exercise volume, with a small increase in volume observed as SPEQ-SM and IC scores moved away from the mean.

Impression motivation, but not impression construction, appeared to have a small positive effect on exercise intensity (IC had an unexpected but very small negative effect). The IM effect was again quadratic, but opposite the effect of self-presentation on volume, such that IM scores closer to the mean were indicative of greater exercise intensity. Impression motivation was determined to have a unique effect on exercise intensity, over and above the effect of identity, but identity still accounted for more of the variance in intensity. Mediation analysis revealed indirect effects of self-presentation on volume through identity and of impression motivation on intensity through identity. Moderation analysis showed an interaction between IM and identity: at lower levels of exercise identity, a higher IM score is associated with greater exercise intensity, while at higher levels of exercise identity, lower IM scores are associated with greater exercise intensity.

Study 3 also examined the effects of exercise identity and behavior on self-presentation. The effect of exercise behavior on self-presentation appeared to be

mediated by identity, with intensity having a greater indirect effect on IM than volume had on the combined SPEQ-SM score or the IC score. Intensity also appeared to interact with identity in its effect on impression motivation, but not in its effect on impression construction, which was, surprisingly, negative. Identity alone accounted for about 30% of the variance in SPEQ-SM score, with fear of negative evaluation explaining an additional 5% of the variance.

I was, quite honestly, surprised that exerciser self-presentation in social media did not have a more pronounced effect on exercise behavior—based on the exploratory interviews I conducted as part of Study 1, and also from my own experience (though granted, there is no statistical significance when n=1). The quadratic effect was also surprising; I expected a positive linear effect of self-presentation on exercise behavior. As I noted in the discussion section of Study 3, the lower SPEQ-SM scores associated with an increase in volume may have a simple explanation, such as a trade-off between social media time and gym time. But it's likely more complicated than that. People have different motivations for working out; seeking attention and approval is only one of these. Recall from Study 1 that higher IC scores were associated with a control orientation. Individuals with low SPEQ-SM scores tend to be more intrinsically motivated—but they may still be highly motivated to work out, resulting in higher exercise volume. This may also help explain the negative association between IC and intensity: intense workouts are likely more intrinsically satisfying, which could lessen the need for external motivation, such as that derived from social media activity.

Perhaps the low correlations should not have come as a surprise: Conroy et al. (2000), who developed the original SPEQ, found that impression motivation was significantly correlated with exercise volume, but impression construction was not. However, their IC scale was based only on offline activities: dressing in exercise clothing, exercising in front of others, and talking about exercise—literally performative endeavors, some of which unequivocally require actual participation in exercise. IC scale items from the SPEQ-SM may be read as performative as well, but there's another possibility: that they are constructive. That is, that they are not just performative in the Goffmanian sense—face work, or putting on a show intended to elicit favorable impressions from others—but also as described by Judith Butler (2006): repetition and ritual serving to construct and fix a norm (of being an exerciser). Put another way, social media activity may function more as a way to construct or bolster a new identity as an exerciser than to display an existing, ingrained one. Identity appeared to mediate the effect of self-presentation on behavior; it's possible that IC activities strengthen identity, which increases exercise behavior. In fact, publicly claiming membership in a social category, such as "exerciser," has been shown to help cement the identity and promote behavior consistent with it (Schlenker et al., 1994). To determine if this is indeed what is happening, a longitudinal study should be conducted, measuring identity, self-presentation, and exercise behavior over time. If this relationship is supported, it would point to the usefulness of encouraging IC for the purpose of identity construction in new or aspiring exercisers. This is in line with recommendations to

promote development of an exercise identity so that individuals are more likely to exercise (de Bruijn & van den Putte, 2012; Springer et al., 2013).

My recruitment approach targeted individuals who were at least occasional exercisers, but my samples ended up being composed predominantly of regular exercisers—almost half (48%) of the respondents in Study 3 had been exercising regularly for six month or more, and another 31% worked out regularly, but had done so for less than six months. The mean exercise identity score was about 47 on a scale with possible values of 9-63, or 75% of the maximum possible score. It is possible that because this group of people had such strong exercise identities, the potential effects of self-presentation were somewhat obscured. As noted in Study 3, the effects of impression motivation on exercise intensity appear to decline at higher levels of exercise identity. It may be that once an identity is established, it continually drives identity-congruent behavior, but as the identity is forming, impression motivation stands in for that identity as a behavioral influence. IM is about seeking recognition for characteristics one has or aspires to; once someone is secure in an identity, perhaps they need less external validation of it. A longitudinal study would be required to ascertain whether this explains the observed relationship between IM and exercise intensity.

While it is clear that more investigation is warranted, these studies contribute in a small way to the literature by taking initial steps to explore the link between exerciser self-presentation in social media and exercise behavior. A number of studies have examined the link between identity and behavior, including

in exercise-specific contexts (see, e.g., Ajzen & Fishbein, 1980; Anderson & Cychosz, 1994, 1995; Biddle, Bank, & Slavings, 1987; Hagger, Anderson, Kyriakaki, & Darkings, 2007; Strachan & Brawley, 2007; Stryker & Serpe, 1982; Stryker & Statham, 1985). The link between identity and self-presentation in the online environment has also been examined (e.g., Ellison, Heino, & Gibbs, 2006; Hancock & Toma, 2009; Kretz & Voyer, 2012; Zhao, Grasmuck, & Martin, 2008). Researchers have considered the use of social media and other online applications as motivational tools for exercisers and aspiring exercisers, but their work has focused on using these tools to provide education, reminders, or support to participants, rather than exploring exercise-related identity work done in online environments (e.g., Cavallo et al., 2012; Foster, Linehan, Kirman, Lawson, & James, 2010; Korda & Itani, 2013; Zhang, Brackbill, Yang, & Centola, 2015). My work here attempts to synthesize the work of others on identity-behavior and identity-social media relationships with explorations of the social media-behavior connection.

This work is not without its limitations, chief among these being the cross-sectional nature of all three studies, which precludes making any causal claims. Longitudinal studies should be undertaken in service of such claims, and these should include the measurement of additional instrumental variables that can help determine causal direction in the theoretical model. Ideally, such studies would measure self-presentation and exercise behavior at several points in time. It would then be possible to determine not only if self-presentation at earlier time points predicts exercise behavior at later times, but also if a change in self-presentation

activity predicts a change in behavior. An experimental design in which an impression construction intervention is administered to a group of randomly assigned participants might also yield stronger evidence of a presentation-behavior relationship.

Another limitation of the present study may be the behavioral measures employed. Although similar measures were successfully used in other studies, it may be that these are not the best measures for a study of this nature. The volume measure seems reasonable and relatively straightforward, but the intensity measure, despite being previously used and validated by others, may not have been. The measure may be particularly problematic for individuals who engage in a variety of activities of varying intensity and thus may have difficulty assessing the intensity of a typical exercise session. In addition, there is a well-known tendency for individuals to exaggerate reports of socially desirable behavior such as exercise. Measuring exercise behavior at baseline and follow-up using a different mechanism, such as using wearable activity trackers or having participants report their workouts via text message immediately after exercise, could provide a better measure. In addition, since over reporting of physical activity has been associated with measures of social desirability bias (Adams et al., 2005), it's probably worth including a measure of such bias and controlling for it. Future inquiries in this area would do well to test such alternative behavioral measures and controls that might provide more reliable data and reveal a stronger relationship with self-presentation in social media, as measured by the SPEQ-SM.

The samples used in these studies, particularly in Study 3, present another possible limitation; because they were mostly comprised of regular exercisers with established exercise identities, I could not use these samples to properly assess the effects of self-presentation on exercise behavior for new, occasional, or aspiring exercisers. There is opportunity for future research to focus specifically on these groups, for which self-presentation (conducted in the service of identity construction) might hold great promise as a motivational tool. In particular, good results might be obtained by recruiting non-exercisers or very new exercisers for an experimental intervention that prescribes impression construction activity to randomly assigned participants.

One final limitation of note is that of researcher deficiency, or the always inherent limitation of not knowing as much as one could. The knowledge I've gained since commencing work on this project would lead me to structure it differently, were I to embark on it today. And still, warts and all, this dissertation offers two important things: 1) the creation and validation of a brand new impression construction scale focused on social media-based exerciser self-presentation; and 2) groundwork for more scholarly exploration of the influence of online identity work on offline behavior, particularly in the realm of exercise (and potentially other health behaviors). I hope that it also offers an inkling of the practical application of prescribing identity work on social media as part of a multi-prong approach to behavioral modification.

Appendix A: Study 1 Instruments

Study 1 Pretest Survey

What is your age?

What is your gender?

Fear of Negative Evaluation Scale

Answer options are a five-point scale (1 = not at all characteristic of me; 5 = extremely characteristic of me). Items marked "(R)" are reverse scored.

FNE1. I worry about what other people will think of me even when I know it doesn't make any difference.
FNE2. I am unconcerned even if I know people are forming an unfavorable impression of me. (R)
FNE3. I am frequently afraid of other people noticing my shortcomings.
FNE4. I rarely worry about what kind of impression I am making on someone. (R)
FNE5. I am afraid that others will not approve of me.
FNE6. I am afraid that people will find fault with me.
FNE7. Other people's opinions of me do not bother me. (R)
FNE8. When I am talking to someone, I worry about what they may be thinking of me.
FNE9. I am usually worried about what kind of impression I make.
FNE10. If I know someone is judging me, it has little effect on me. (R)
FNE11. Sometimes I think I am too concerned with what other people think of me.
FNE12. I often worry that I will say or do the wrong things.

Social Media Use

SMU1. Thinking back *over the past seven days*, on how many days did you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube. (*answer options: 0-7*)

SMU2. The previous question asked about your social media use last week. This one concerns your social media use in a typical week, which may be different than last week.
In a *typical week*, how many days do you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube. (*answer options: 0-7*)

How often do you post memes on social media?
(*Rarely or never, Occasionally, Frequently, I don't know what a meme is*)

Mechanisms

Answer options are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

M1. Posting my intentions to do something on social media makes me more accountable to my friends and followers.
M2. Posting information about my activities to social media makes me more accountable to my friends and followers.
M3. I get support for my endeavors from friends and followers on social media.
M4. I learn new information about things I care about from my network on social media.
M5. I am inspired to do things by posts I see on social media.
M6. Social media connects me with a community of people who care about things that are important to me.

Study 1 Complete Survey

What is your age?

What is your gender?

Exercise Stage of Change

Exercise is defined as activity requiring physical effort, carried out especially to sustain or improve health and fitness. Which statement below best describes you?

a. I currently do not exercise, and I do not intend to start exercising in the next 6 months
b. I currently do not exercise, but am thinking about starting to exercise in the next 6 months
c. I currently exercise some, but not regularly
d. I currently exercise regularly, but I have only begun doing so within the last 6 months
e. I currently exercise regularly and have done so for longer than 6 months

Exercise Behavior *(only asked of respondents who chose options c, d, or e above)*

How frequently do you exercise?

(less than once per week, 1-2 days per week, 3-4 days per week, 5 or more days per week)

Social Media Use

For the purpose of this survey, social media is defined as websites and applications that enable users to create and share content or to participate in social networking.

Thinking back *over the past seven days*, on how many days did you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube, Reddit. (*answer options: 0-7*)

The previous question asked about your social media use last week. This one concerns your social media use in a typical week, which may be different than last week. In a *typical week*, how many days do you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube, Reddit. (*answer options: 0-7*)

Social Media Behavioral Measures

Answer options for all questions in this section are 5-point Likert (never, rarely, sometimes, often, all of the time).

Thinking back over the past seven days, how often did you post on social media:

a. Information about your workouts or fitness activities?
b. Photos of your workouts or fitness activities?
c. Videos of your workouts or fitness activities?
d. Articles related to exercise and fitness?
e. Memes (shared content) about exercise and fitness?
f. A photo, video, or other content from an athlete or fitness celebrity?
g. A link, photo, or other content from a fitness related brand (for example, Nike)?

Thinking back over the past seven days, how often did your friends and followers engage with your fitness related social media posts by:

a. Liking them?
b. Commenting on them?
c. Sharing them?

The previous two questions asked about your social media activity over the last week. The next two ask about your social media activity in a typical week, which may be different than last week.

In a typical week, how often do you post on social media:

a. Information about your workouts or fitness activities?
b. Photos of your workouts or fitness activities?
c. Videos of your workouts or fitness activities?
d. Articles related to exercise and fitness?
e. Memes (shared content) about exercise and fitness?
f. A photo, video, or other content from an athlete or fitness celebrity?
g. A link, photo, or other content from a fitness related brand (for example, Nike)?

In a typical week, how often do your friends and followers on social media:

a. Like one of your fitness related posts?
b. Comment on one of your fitness related posts?
c. Share one of your fitness related posts?

SPEQ-SM Impression Motivation Subscale

Answer options for all SPEQ-SM questions are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

IM1. I value the attention and praise of others when they regard me as being in good shape.
IM2. I enjoy the praise I often receive for exercising.
IM3. I try to appear fit and healthy to others.
IM4. Receiving praise about my exercise efforts makes me want to exercise more.
IM5. I want to be thought of as a person who exercises.
IM6. I value the attention and praise offered by others in regard to appearing physically fit.

SPEQ-SM Impression Construction Subscale

Answer options for all SPEQ-SM questions are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

IC1. I emphasize my dedication to fitness on my social media profile(s).
IC2. I post status updates about exercise and fitness on social media.
IC3. I share information about nutrition on social media.
IC4. I share information about my workouts and athletic activities on social media.
IC5. I post photos of myself engaging in exercise or sports on social media.
IC6. I post videos of myself engaging in exercise or sports on social media.
IC7. I share the results of my fitness activities on social media.
IC8. I prefer to connect to physically active people on social media.
IC9. I try to have a large group of athletic friends on social media.
IC10. I share exercise related content from others on social media.
IC11. I post articles about exercise and fitness on social media.
IC12. I post memes or other shared content about exercise on social media.
IC13. I connect with sports and fitness brands on social media.
IC14. I share my sports and exercise accomplishments on social media.
IC15. I follow athletes or fitness celebrities on social media.

What other types of exercise-related content do you post on social media? *(Open-ended; text box).*

Mechanisms

Answer options are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

M1. Posting my intentions to exercise on social media makes me more accountable to my friends and followers.
M2. Posting information about my workouts and fitness activities to social media makes me more accountable to my friends and followers.
M3. I get support for my exercise endeavors from friends and followers on social media.
M4. I learn new information about exercise and fitness from my network on social media.
M5. I am inspired to exercise by posts I see on social media.
M6. Social media connects me with a community of people who care about exercise and fitness.

Fear of Negative Evaluation Scale

Answer options are a five-point scale (1 = not at all characteristic of me; 5 = extremely characteristic of me).

FNE1. I worry about what other people will think of me even when I know it doesn't make any difference.
FNE2. I am frequently afraid of other people noticing my shortcomings.
FNE3. I am afraid that others will not approve of me.
FNE4. I am afraid that people will find fault with me.
FNE5. When I am talking to someone, I worry about what they may be thinking of me.
FNE6. I am usually worried about what kind of impression I make.
FNE7. Sometimes I think I am too concerned with what other people think of me.

Exercise Causality Orientation Scale

Each item for each scenario below is measured on a 7-point Likert scale (very unlikely, unlikely, somewhat unlikely, undecided, somewhat likely, likely, very likely).

ECOS1. You are beginning a new exercise program. You are likely to:

a. Attend a structured exercise class where an exercise leader is telling you what to do.
b. Decide for yourself which type of exercise you would like to complete.
c. Tag along with your friends and do what they do.

ECOS2. You are asked to keep a record of all the weekly exercise you have completed in an exercise diary. You are likely to view the diary:

a. As a reminder of how incapable you are at fulfilling the task.
b. As a way to measure your progress and to feel proud of your achievements.
c. As a way of pressuring yourself to exercise.

ECOS 3. In order to monitor how well you are doing in an exercise program you are likely to want to:

a. Be given a lot of praise and encouragement from others.
b. Evaluate your own performance and provide yourself with positive feedback.
c. Just hope that what you are doing is correct.

ECOS4. You have been exercising regularly for 6 months but recently you have been missing sessions and are finding it hard to get motivated to exercise. You are likely to:

a. Approach someone to help motivate you.
b. Ignore the problem; nothing can be done to improve your motivation.
c. Employ your own strategies to motivate yourself.

ECOS5. You have been told that setting goals is a good way to motivate yourself to exercise. You would likely:

a. Set your own realistic but challenging goals.
b. Make someone important to you set goals for you to aim for.
c. Not set goals because you may not be able to live up to them.

ECOS6. During a discussion with an exercise counselor he/she presents many options on the best way for you to exercise to achieve fitness and health benefits. It is likely that your first thought would be:

a. What do you (the exercise leader) think I should do?
b. What do I think is the best option for me?
c. What has everyone else done in the past?

ECOS7. During an exercise session how hard you are working out is likely to be governed by:

a. The intensity you have been told to exercise at.
b. What everyone around you is doing.
c. How you are feeling whilst exercising at the intensity you choose.

Exercise Type

What types of exercise do you typically engage in? (Select all that apply.)
Walking, Running or jogging, Strength training/weight lifting, Yoga, CrossFit, Swimming, Cycling, Martial arts, Pilates, Zumba or other aerobic dance, Roller or ice skating, Team sports, Racquet sports, Gymnastics, Other

Appendix B: Study 3 Instrument

What is your age?

What is your gender?

SOC. Which statement below best describes you?

a. I currently do not exercise, and I do not intend to start exercising in the next 6 months
b. I currently do not exercise, but am thinking about starting to exercise in the next 6 months
c. I currently exercise some, but not regularly
d. I currently exercise regularly, but I have only begun doing so within the last 6 months
e. I currently exercise regularly and have done so for longer than 6 months

Exercise Identity

7-point Likert scale ranging from strongly disagree (1) to strongly agree (7)

ExID1. I consider myself an exerciser.
ExID2. When I describe myself to others, I usually include my involvement in exercise.
ExID3. I have numerous goals related to exercising.
ExID4. Physical exercise is a central factor to my self-concept.
ExID5. I need to exercise to feel good about myself.
ExID6. Others see me as someone who exercises regularly.
ExID7. For me, being an exerciser means more than just exercising.
ExID8. I would feel a real loss if I were forced to give up exercising.
ExID9. Exercising is something I think about often.

Identity Salience

We derive our identities—that is, our self-concepts—from many different sources, including our demographic characteristics, groups we are affiliated with, things we do, and interests we hold. Some examples of these identity influencers are listed below. Please indicate the importance of each to your own identity using the scales provided. [*7-point Likert scale from not at all important to extremely important*]

- Exercise/physical fitness
- Occupation/career
- Academic accomplishments
- Familial relationships
- Religion/faith/spirituality
- Nationality
- Racial or ethnic identity
- Gender identity

- Sexuality
- Political party affiliation
- Membership in a social organization
- Affiliation with a charitable, social, or political cause
- A hobby (other than exercise)

Exercise Behavior

EXB1. Thinking back over the past week, on how many days did you exercise? [0-7]

EXB2. How many days do you exercise *in a typical week*? [0-7]

EXB3. Thinking back over **the past week**, what was the average duration of your exercise sessions? Please enter the number of minutes. For example, if your average exercise session was one and a half hours, you would enter 90.

EXB4. About how long do your exercise sessions **typically** last? Please enter the number of minutes. For example, if your exercise sessions typically last one and a half hours, you would enter 90.

EXB5. Which of the following best describes your typical exercise session?
   a. Not much different from other parts of my daily routine
   b. Rarely or never sweat
   c. Energetic but able to talk conversationally, rarely sweat
   d. Energetic but able to talk, often sweat
   e. Breathing heavily, sweating
   f. Breathless, sweating

SPEQ-SM Impression Motivation Subscale

Answer options for all SPEQ-SM questions are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

IM1. I value the attention and praise of others when they regard me as being in good shape.

IM2. I enjoy the praise I often receive for exercising.

IM3. I try to appear fit and healthy to others.

IM4. Receiving praise about my exercise efforts makes me want to exercise more.

IM5. I want to be thought of as a person who exercises.

IM6. I value the attention and praise offered by others in regard to appearing physically fit.

Social Media Use

For the purpose of this survey, social media is defined as websites and applications that enable users to create and share content or to participate in social networking.

SMU1. Thinking back *over the past seven days*, on how many days did you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube, Reddit. (*answer options: 0-7*)

SMU2. The previous question asked about your social media use last week. This one concerns your social media use in a typical week, which may be different than last week.

In a *typical week*, how many days do you use each of the following types of social media? Facebook, Instagram, Twitter, Google+, Pinterest, Tumblr, YouTube, Reddit. (*answer options: 0-7*)

SPEQ-SM Impression Construction Subscale

Answer options for all SPEQ-SM questions are a six-point Likert scale (strongly disagree, disagree, somewhat disagree, somewhat agree, agree, strongly agree).

IC1. I emphasize my dedication to fitness on my social media profile(s).
IC2. I post status updates about exercise and fitness on social media.
IC3. I share information about nutrition on social media.
IC4. I share information about my workouts and athletic activities on social media.
IC5. I post photos of myself engaging in exercise or sports on social media.
IC6. I post videos of myself engaging in exercise or sports on social media.
IC7. I share the results of my fitness activities on social media.
IC8. I prefer to connect to physically active people on social media.
IC9. I try to have a large group of athletic friends on social media.
IC10. I share exercise related content from others on social media.
IC11. I post articles about exercise and fitness on social media.
IC12. I post memes or other shared content about exercise on social media.
IC13. I connect with sports and fitness brands on social media.
IC14. I share my sports and exercise accomplishments on social media.
IC15. I follow athletes or fitness celebrities on social media.

Exercise Intention

How likely are you to exercise in the next seven days? [7-point Likert scale ranging from highly unlikely (1) to highly likely (7)]

How many days do you intend to exercise out of the next seven days?

Fear of Negative Evaluation Scale

Answer options are a five-point scale (1 = not at all characteristic of me; 5 = extremely characteristic of me).

FNE1. I worry about what other people will think of me even when I know it doesn't make any difference.
FNE2. I am frequently afraid of other people noticing my shortcomings.
FNE3. I am afraid that others will not approve of me.
FNE4. I am afraid that people will find fault with me.
FNE5. When I am talking to someone, I worry about what they may be thinking of me.
FNE6. I am usually worried about what kind of impression I make.
FNE7. Sometimes I think I am too concerned with what other people think of me.

Exercise Type

What types of exercise do you typically engage in? (Select all that apply.)
Walking, Running or jogging, Strength training/weight lifting, Yoga, CrossFit, Swimming, Cycling, Martial arts, Pilates, Zumba or other aerobic dance, Roller or ice skating, Team sports, Racquet sports, Gymnastics, Other

Appendix C: Study 3 Additional Analyses

Linearity Analysis

Table 20: Tests of Linearity in Key Variable Relationships

Variables	Association		Deviation from Linearity	
	R^2	η^2	F	p
SPEQ-SM and exercise volume	.055	.072	3.042	.029
IM and exercise volume	.042	.061	3.436	.017
IC and exercise volume	.048	.061	2.473	.061
SPEQ-SM and exercise intensity	.007	.017	1.247	.290
IM and exercise intensity	.031	.040	1.281	.276
IC and exercise intensity	.001	.013	1.521	.195
SPEQ-SM and exercise identity	.275	.294	4.553	.004
IM and exercise identity	.339	.361	5.851	.001
IC and exercise identity	.198	.231	3.118	.026
SPEQ-SM and identity salience	.016	.052	6.140	<.001
IM and identity salience	.009	.032	3.972	.008
IC and identity salience	.023	.066	7.452	<.001
SPEQ-SM and FNE	.072	.079	1.155	.327
IM and FNE	.075	.095	3.719	.011
IC and FNE	.058	.060	.445	.721
Exercise identity and identity salience	.041	.067	4.500	.004
Exercise volume and exercise intensity	.019	.024	.580	.678

Identity and Identity Salience

As the table below shows, exerciser identity was particularly important among study participants, ranking second overall, behind only familial identities (e.g., identity as a father, mother, or sibling).

Table 21: Relative Importance of Different Identity Categories

	Mean	SD
Familial relationships	5.31	1.783
Exercise/physical fitness	5.14	1.566
Occupation/career	4.90	1.744
A hobby other than exercise	4.88	1.633
Academic accomplishments	4.69	1.809
Sexuality	4.48	1.886
Gender identity	4.32	1.995
Religion/faith/spirituality	4.32	2.103
Nationality	4.17	1.912
Affiliation with a charitable, social, or political cause	4.00	1.841
Racial or ethnic identity	3.89	1.917
Membership in a social organization	3.86	1.753
Political party affiliation	3.66	1.906

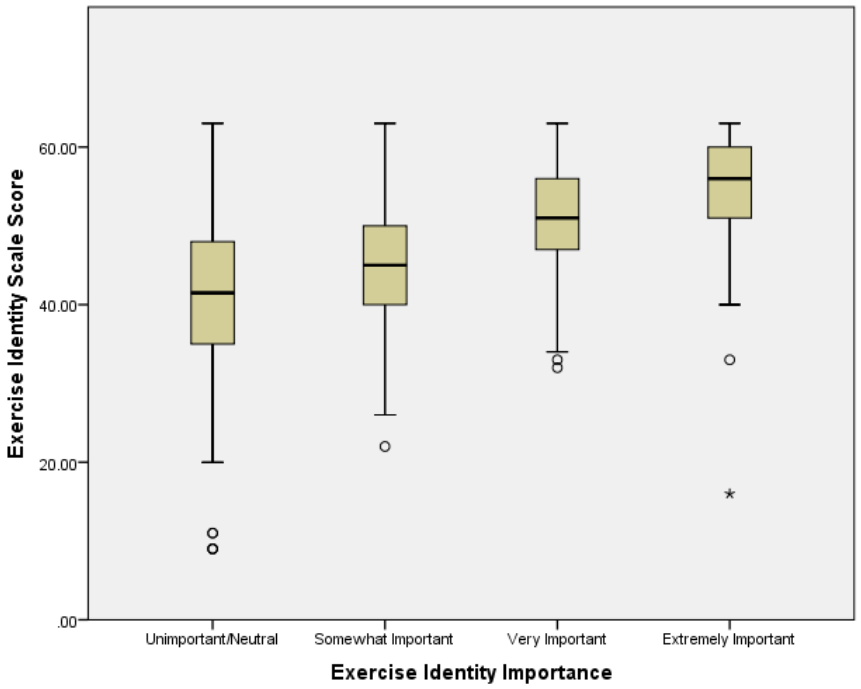
The importance rating assigned to exercise/physical fitness as an identity category was recoded into four categories, with scores of 1-4 (unimportant or neutral) combined into a single category, and scores of 5 (somewhat important), 6 (very important), and 7 (extremely important) retained as separate categories. Mean exercise identity scores were calculated for each group; results are shown below.

Table 22: Mean Exercise Identity Score by Exercise Importance

Exercise Identity Importance	N	Mean	SD
Unimportant or neutral	134	40.5821	11.50502
Somewhat important	138	44.8333	7.42513
Very important	137	50.4818	6.62782
Extremely important	102	54.9020	7.60733
Total	511	47.2427	10.01410

This suggests that there is a linear relationship between the measure of a participant's exercise identity and the importance assigned to that identity by the participant. The stronger the identity as measured by the Exercise Identity Scale (EIS), the more likely the participant was to rate that identity as important to their sense of self. However, as the box plot below shows, there is a great deal of overlap in EIS scores from one category to the next.

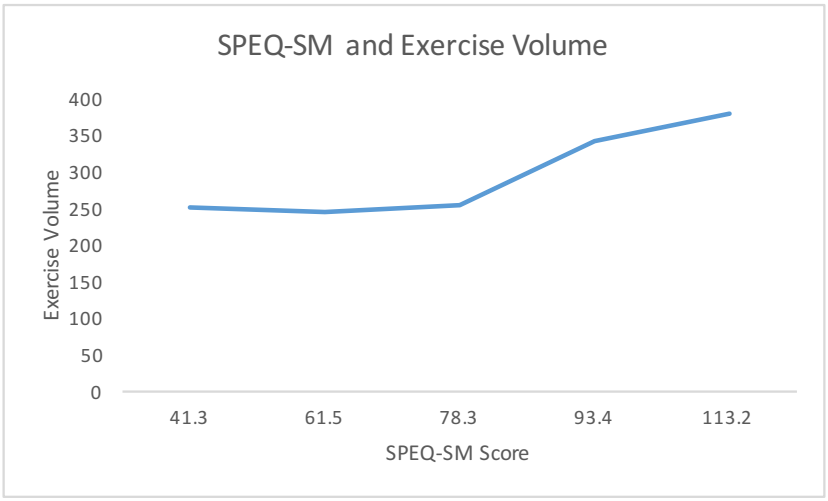
Figure 18: Exercise Identity Score and Identity Importance



Influence of Exercise Self-Presentation on Behavior

As shown in the graph below, the relationship between total SPEQ-SM score and exercise volume appears to be slightly non-monotonic. Volume is roughly equivalent at lower to moderate levels of self-presentation, then increases at higher levels of self-presentation.

Figure 19: Nonlinearity in the SPEQ-SM – Volume Relationship



Decomposing the SPEQ-SM score into its two subscale components, again plotting the mean volume score for each scale category, suggests that IM and IC may have somewhat different effects on exercise volume.

Figure 20: Nonlinearity in the IM – Volume Relationship

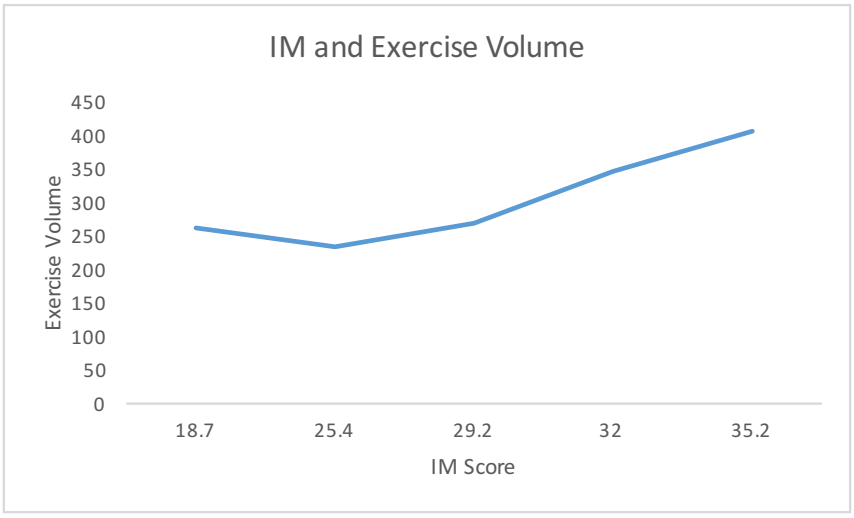
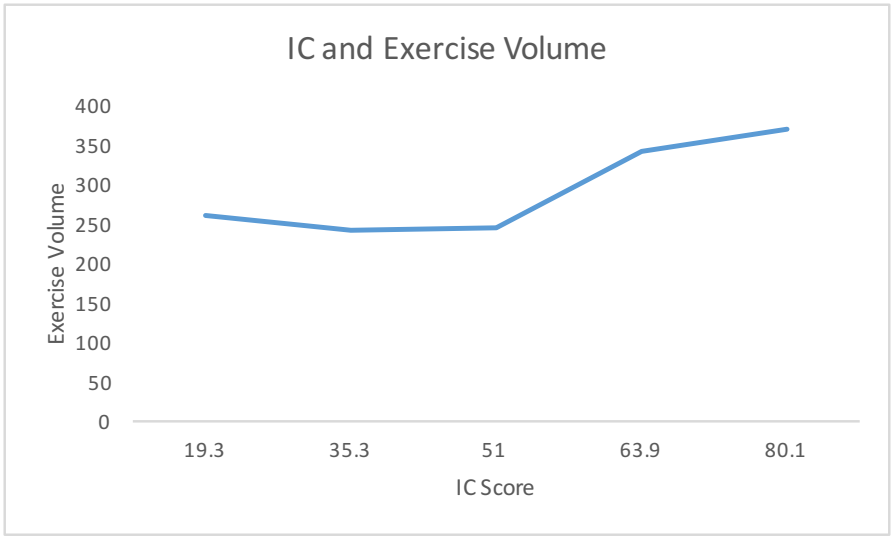
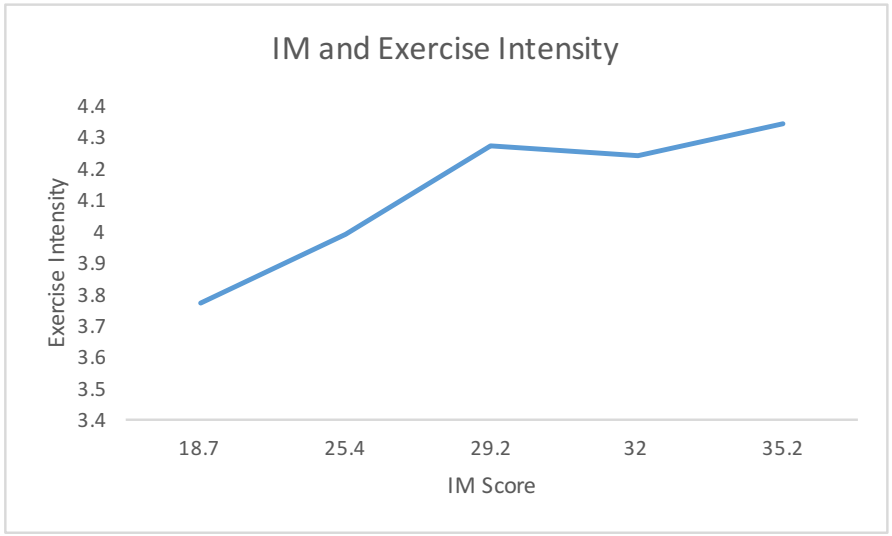


Figure 21: Nonlinearity in the IC – Volume Relationship



A plot of IM score categorical means against intensity shows what may be a quadratic or cubic relationship. The cubic transformation of the IM variable turned out not to be significant.

Figure 22: Nonlinearity in the IM – Intensity Relationship



Regression Analyses for SPEQ-SM and Behavioral Measures

Table 23: Regression Coefficients and Significance, Exercise Volume as Dependent Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
1	(Constant)	128.771	29.758		4.327	.000	.060
	SPEQ-SM	2.099	.368	.245	5.701	.000	
2	(Constant)	389.992	74.936		5.204	.000	.086
	SPEQ-SM	-5.565	2.055	-.649	-2.708	.007	
	SPEQ-SM^2	.050	.013	.909	3.789	.000	
3	(Constant)	89.469	43.552		2.054	.040	.042
	IM	7.327	1.555	.204	4.713	.000	
4	(Constant)	489.905	104.456		4.690	.000	.074
	IM	-27.528	8.432	-.768	-3.265	.001	
	IM^2	.705	.168	.989	4.204	.000	
5	(Constant)	177.103	23.255		7.616	.000	.052
	IC	2.283	.431	.229	5.297	.000	
6	(Constant)	330.643	46.881		7.053	.000	.078
	IC	-5.360	2.079	-.537	-2.578	.010	
	IC^2	.077	.020	.782	3.756	.000	
7	(Constant)	98.425	79.959		1.231	.219	.185
	SPEQ-SM	-6.127	1.943	-.715	-3.153	.002	
	SPEQ-SM^2	.042	.013	.764	3.362	.001	
	ExID	8.185	1.042	.378	7.856	.000	
8	(Constant)	-129.961	42.586		-3.052	.002	.167
	SPEQ-SM	.258	.415	.030	.622	.534	
	ExID	8.468	1.049	.391	8.073	.000	
9	(Constant)	102.661	110.309		.931	.352	.175
	SPEQ-SM	-3.332	1.625	-.389	-2.050	.041	
	ExID	3.653	2.352	.169	1.553	.121	
	SPEQ-SM *ExID	.072	.031	.580	2.284	.023	
10	(Constant)	95.480	109.807		.870	.385	.185
	SPEQ-SM	-6.114	1.976	-.713	-3.095	.002	
	ExID	8.296	3.011	.383	2.755	.006	
	SPEQ-SM *ExID	-.002	.043	-.014	-.039	.969	
	SPEQ-SM^2	.043	.017	.773	2.451	.015	
11	(Constant)	-127.763	42.306		-3.020	.003	.168
	IC	.481	.458	.048	1.051	.294	
	ExID_total	8.338	.991	.385	8.410	.000	
12	(Constant)	48.063	91.630		.525	.600	.176
	IC	-3.793	2.030	-.380	-1.869	.062	
	ExID	4.698	1.952	.217	2.406	.016	
	IC*ExID	.085	.039	.535	2.161	.031	

13	(Constant)	47.083	91.481		.515	.607	.180
	IC	-5.378	2.245	-.538	-2.395	.017	
	ExID	6.248	2.166	.289	2.884	.004	
	IC*ExID	.041	.048	.258	.860	.390	
	IC^2	.039	.024	.396	1.638	.102	

Table 24: Regression Coefficients and Significance, Exercise Intensity as Dependent Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
1	(Constant)	2.901	.239		12.144	.000	.050
	IM	.044	.009	.222	5.149	.000	
2	(Constant)	1.540	.579		2.660	.008	.062
	IM	.162	.047	.823	3.473	.001	
	IM^2	-.002	.001	-.610	-2.577	.010	
3	(Constant)	-.048	1.162		-.042	.967	.066
	IM	.423	.172	2.143	2.462	.014	
	IM^2	-.015	.008	-3.762	-1.868	.062	
	IM^3	.000	.000	1.870	1.576	.116	
4	(Constant)	.265	.597		.444	.657	.126
	IM	.168	.045	.851	3.719	.000	
	IM^2	-.003	.001	-.844	-3.640	.000	
	ExID	.039	.006	.327	6.120	.000	
5	(Constant)	2.221	.263		8.452	.000	.103
	IM	.008	.011	.041	.762	.446	
	ExID	.035	.006	.295	5.530	.000	
6	(Constant)	-1.375	.741		-1.856	.064	.148
	IM	.153	.030	.776	5.128	.000	
	ExID	.117	.017	.981	6.890	.000	
	IM*ExID	-.003	.001	-1.295	-5.175	.000	
7	(Constant)	-1.370	.742		-1.847	.065	.149
	IM	.146	.045	.738	3.235	.001	
	ExID	.120	.023	1.010	5.177	.000	
	IM*ExID	-.003	.001	-1.355	-3.635	.000	
	IM^2	.000	.001	.074	.218	.828	

Table 25: Regression Coefficients and Significance, SPEQ-SM Score as Dependent Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
1	(Constant)	68.471	1.815		37.730	.000	.060
	Volume	.029	.005	.245	5.701	.000	
2	(Constant)	64.680	2.517		25.698	.000	.069
	Volume	.054	.013	.462	4.240	.000	
	$Volume^2$	-2.707E-5	.000	-.236	-2.165	.031	
3	(Constant)	65.607	3.312		19.809	.000	.069
	Volume	.043	.028	.370	1.541	.124	
	$Volume^2$	-4.915E-7	.000	-.004	-.008	.994	
	$Volume^3$	-1.578E-8	.000	-.152	-.431	.667	
4	(Constant)	11.587	4.561		2.540	.011	.302
	Volume	.003	.005	.025	.622	.534	
	ExID	1.361	.103	.539	13.278	.000	
5	(Constant)	22.397	6.510		3.440	.001	.309
	Volume	-.049	.023	-.420	-2.139	.033	
	ExID	1.141	.140	.451	8.166	.000	
	Volume*ExID	.001	.000	.495	2.318	.021	
6	(Constant)	23.479	6.712		3.498	.001	.310
	Volume	-.048	.023	-.414	-2.106	.036	
	ExID	1.092	.157	.432	6.949	.000	
	Volume*ExID	.001	.000	.565	2.375	.018	
	$Volume^2$	-8.215E-6	.000	-.072	-.668	.504	
7	(Constant)	11.213	4.519		2.482	.013	.302
	ExID	1.387	.094	.549	14.828	.000	
8	(Constant)	-1.026	4.694		-.218	.827	.359
	ExID	1.356	.090	.537	15.101	.000	
	FNE_total	.699	.103	.241	6.768	.000	
9	(Constant)	8.753	9.917		.883	.378	.361
	ExID	1.154	.202	.457	5.714	.000	
	FNE_total	.180	.475	.062	.379	.705	
	ExIDxFNE	.011	.010	.203	1.119	.264	

Table 26: Regression Coefficients and Significance, Impression Motivation as Dependent Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model R^2
		B	SE	Beta			
1	(Constant)	22.731	.936		24.297	.000	.050
	Intensity	1.128	.219	.222	5.149	.000	
2	(Constant)	22.818	1.737		13.135	.000	.050
	Intensity	1.070	.985	.211	1.087	.278	
	$Intensity^2$	.008	.136	.012	.060	.952	
3	(Constant)	22.557	3.307		6.821	.000	.050
	Intensity	1.385	3.533	.273	.392	.695	
	$Intensity^2$	-.092	1.090	-.132	-.085	.933	
	$Intensity^3$	.009	.102	.084	.093	.926	
4	(Constant)	9.437	1.106		8.536	.000	.381
	Intensity	.142	.187	.028	.762	.446	
	ExID	.367	.022	.607	16.479	.000	
5	(Constant)	1.719	2.552		.674	.501	.394
	Intensity	2.322	.677	.458	3.431	.001	
	ExID	.537	.055	.889	9.692	.000	
	Intensity*ExID	-.047	.014	-.596	-3.349	.001	

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