

Self-Compassion and the Self-Regulation of Exercise: Reactions to Recalled Exercise Setbacks

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Self-compassion facilitates health behavior self-regulation; few studies have examined self-compassion and exercise. This online, cross-sectional study investigated self-compassion's relationship with exercise self-regulation of an exercise setback. Adults ($N = 105$) who had experienced an exercise setback within the last 6 months completed baseline measures, recalled an exercise setback, and completed questionnaires assessing self-regulation in this context. Self-compassion associated with self-determined motivations and exercise goal reengagement, and negatively related to extrinsic motivations, state rumination, and negative affect. Self-compassion predicted unique variance, beyond self-esteem, in exercise goal reengagement, external regulation, state rumination, and negative affect experienced after an exercise setback. Self-compassion and self-esteem had unique relationships with goal reengagement, state rumination, and situational motivation, while having a complementary relationship with negative affect. This research adds to the few studies that examine the role of self-compassion in exercise self-regulation by examining how self-compassion and self-esteem relate to reactions to a recalled exercise setback.

Keywords: goal reengagement, motivation, negative affect, physical activity, rumination, self-esteem

Most Canadians are not active enough (Colley et al., 2011; Statistics Canada, 2016) to achieve health benefits (Lee, Artero, Sui, & Blair, 2010). This trend of inactivity may be due, in part, to the self-regulatory effort required to adhere to exercise (Mermelstein & Revenson, 2013). Self-regulation requires that one set and pursue a goal, monitor goal progress, and adjust behavior when one makes insufficient progress (Baumeister & Heatherton, 1996; Terry & Leary, 2011). Self-regulatory failure can occur in any of these steps (Baumeister & Heatherton, 1996). Therefore, exercise-adherence researchers and practitioners are interested in variables that can improve self-regulation.

Self-Compassion

Researchers argue that an individual's capacity to self-regulate health behaviors is influenced by one's level of *self-compassion* (Terry & Leary, 2011). Self-compassion is the ability to be kind to oneself in the face of distressing situations (Neff, 2003b), and this ability differs among individuals (Neff, 2003a). Self-compassion is composed of three interacting facets: mindfulness versus over-identification or avoidance, self-kindness versus self-judgment, and common humanity versus isolation (Neff, 2003a). Mindfulness involves a balanced awareness of one's thoughts and emotions, without rumination or overidentification (Neff, 2003b). Self-kindness involves meeting thoughts and emotions with care rather than harsh criticism (Neff, 2003b). Common humanity is the recognition of the universality, rather than the uniqueness, of human imperfection and suffering (Neff, 2003b).

Self-Compassion and Self-Regulation

Self-compassion should facilitate health behavior self-regulation, including exercise (Terry & Leary, 2011). If self-compassion is associated with the self-regulation of exercise, this strategy could be targeted within interventions designed to improve exercise adherence. Relative to research showing self-compassion's positive influence in sport (e.g., Ferguson, Kowalski, Mack, & Sabiston, 2014), far less is known about self-compassion and exercise. Below, we outline how self-compassion should aid in the self-regulation of exercise and review available support from the sport and exercise self-compassion literature.

Self-compassionate individuals should succeed at self-regulation because they set and pursue goals for self-determined reasons (e.g., personal growth and well-being) rather than for extrinsic reasons (Neff, Hseih, & Dejitterat, 2005). According to self-determination theory, the self-determined pursuit of goals is optimal as motivations of this quality (e.g., intrinsic) are associated with increased effort, long-term motivation, psychological well-being (Deci & Ryan, 2000), and, in some cases, goal achievement (Teixeira, Carroca, Markland, Silva, & Ryan, 2012). Indeed, among women exercisers (Berry, Kowalski, Ferguson, & McHugh, 2010; Magnus, Kowalski, & McHugh, 2010) and women athletes (Mosewich, Kowalski, Sabiston, Sedgwick, & Tracy, 2011), self-compassion is associated with exercising for intrinsic versus extrinsic reasons. Furthermore, self-compassion is negatively associated with exercising out of extrinsic reasons, such as out of obligation (Magnus et al., 2010) or concern about one's appearance in the presence of others (Magnus et al., 2010; Mosewich et al., 2011).

Self-compassionate people should accurately perceive their goal progress, without self-criticism (Terry & Leary, 2011). This tendency affords them the emotional safety to engage in effective self-monitoring and problem-solving related to goal pursuit (Neff et al., 2005). Effective monitoring and adjustment of goals is

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paramount to goal achievement (Baumeister & Heatherton, 1996), yet people often respond to failure or threats to goal progress in ways that may undermine effective self-monitoring or adjustment. For example, they may ignore the fact that they did not reach their goal and continue with the ineffective behavior. In addition, if they criticize themselves unfairly (Cohen & Sherman, 2014) or ruminate about the failure (Neff et al., 2005), they may believe that they cannot accomplish the task and disengage from the goal. Such responses will hinder adaptive self-monitoring by preventing individuals from accurately judging the situation (Neff et al., 2005) and engaging in adaptive coping and problem-solving (Cohen & Sherman, 2014). Alternatively, being self-compassionate provides the emotional safety needed to engage in effective self-monitoring and adjustment. For instance, in young women athletes, self-compassion was negatively associated with state self-criticism and concern over mistakes and was positively associated with initiative-taking (Ferguson et al., 2014; Mosewich, Crocker, Kowalski, & DeLongis, 2013).

Self-compassion is associated with emotional regulation (Leary, Tate, Adams, Allen, & Hancock, 2007; Neff et al., 2005), which is important during goal pursuit as negative emotions can thwart self-regulation (Baumeister & Heatherton, 1996). Negative emotions tend to bring attention to the immediate situation, thereby reducing an individual's ability to focus on long-term goals, which makes self-regulation difficult (Baumeister & Heatherton, 1996). Instead, self-compassion may provide a strategy to deal with negative emotions associated with a setback while also promoting more positive emotions (Terry & Leary, 2011). In fact, Sirois, Kitner, and Hirsch (2015) demonstrated that self-compassion's positive effect on health behaviors was mediated by positive affect. Furthermore, women athletes who scored higher on self-compassion were more likely to keep the situation in perspective and experienced less total negative affect (Reis et al., 2015) when recalling a hypothetical sport failure than those who scored lower on self-compassion. In addition, women athletes who participated in a self-compassion intervention, compared with women in an attention control group, had lower levels of concern over their mistakes, state self-criticism, and rumination at 1-month follow-up (Mosewich et al., 2013).

There are differences between an athlete and an exerciser that may make the experience of struggle or failure unique within each context. Athletes are often under formalized pressure to succeed and are compared with or evaluated by others (Ferguson et al., 2014); these evaluative experiences may be less formalized in exercise contexts. The specific examination of self-compassion and its association with adaptive self-regulation within an exercise context is warranted given that the experience of exercise failure may be unique from those experienced within sport.

None of the four studies (that we know of) that have examined self-compassion and exercise (Berry et al., 2010; Magnus et al., 2010; Sirois, 2015; Sirois et al., 2015) have examined self-compassion's role in exercise self-regulation after an exercise setback. By definition, self-compassion is a reaction to one's suffering or "personal mistakes, perceived inadequacies, or various experiences of life difficulty" (Neff & Knox, 2017, p. 1). Self-compassion should be especially useful when one is responding to a personal exercise setback. Therefore, we positioned this study to examine whether self-compassion is associated with self-regulatory benefits within the context of a recalled exercise setback. This approach provides an ecologically valid test of the general association between self-compassion and self-regulatory variables that has been supported to date, and this method is consistent

with past self-compassion research in the general health domain (Leary et al., 2007; Reis et al., 2015).

Self-Compassion's Relationship to Global Self-Esteem

Self-compassion researchers recognize similarities and distinctions between self-compassion and global self-esteem. Global self-esteem is an overall feeling of self-worth based on how competent one feels in valued life areas (James, 1890). In contrast, self-compassion is an orientation to care for oneself (Leary et al., 2007). Instead of judging oneself relative to a standard, self-compassion allows individuals to be mindful of how they feel, respond kindly, and realize that everyone makes mistakes (Neff, 2003b).

Enduring research interest in global self-esteem has been driven by this variable's association with several positive outcomes (e.g., positive self-emotions; Lucas, Diener, & Suh, 1996). Self-esteem may motivate individual effort to achieve goals in contingent domains (Crocker, 2002). For example, if one's self-esteem was contingent on exercise success, one would be motivated to increase exercise effort in order to maintain or increase his or her self-esteem (Crocker, 2002). A prospective study by Crocker, Karpinski, Quinn, and Chase (2003) found that students' contingencies of self-esteem assessed prior to the start of college predicted their self-reports of many contingency consistent behaviors during their time as an undergraduate student (i.e., time studying).

Researchers have questioned the benefits of self-esteem as they identify ways in which this construct can be *detrimental* to growth and well-being. Self-esteem fluctuates depending on whether or not a behavior falls in line with a standard (Crocker et al., 2003; Ford & Collins, 2010; Leary et al., 2007). Faced with this potential for fluctuation, individuals often seek self-esteem maintenance, sometimes with detrimental consequences including the dismissal of negative feedback, failure to take responsibility for mistakes, or engagement in maladaptive goal setting (Leary et al., 2007; Sedikides, 1993). These responses can prevent people from developing an accurate self-concept, which can affect their ability to adaptively self-regulate (Crocker & Park, 2004) thereby limiting growth and change (Sedikides, 1993).

In light of the unique and complex roles that both self-compassion and self-esteem can play in self-regulating behaviors, researchers have begun to examine both variables together in contexts, such as sport and exercise (Magnus et al., 2010; Mosewich et al., 2011). For instance, self-compassion predicted unique variance above self-esteem on variables, such as shame proneness, fear of failure, and introjected motivation (Magnus et al., 2010; Mosewich et al., 2011), while self-compassion did not account for any unique variance in variables, such as intrinsic motivation and external regulation (Magnus et al., 2010), once the influence of self-esteem had been considered. Therefore, in the present study, we examined the influence of self-compassion, as well as the unique and complementary roles of self-compassion and self-esteem to determine what reactions, thoughts, and outcomes are associated with each of these self-related variables.

Aims and Hypotheses

The purpose of this study was to examine self-compassion's role in the adaptive self-regulation of exercise after an exercise setback. We pursued this purpose by examining indicators of effective self-regulation. In addition, as self-compassion and self-esteem are

correlated (Neff & Vonk, 2009) and previous researchers have suggested that they may have complementary but distinct roles in a sport/exercise context (Magnus et al., 2010; Mosewich et al., 2011), we examined self-compassion and self-esteem to assess their unique and/or complementary relationships with these self-regulatory outcomes.

We had three main hypotheses that were grounded in past research and theory. First, we hypothesized that self-compassion would be positively related to self-determined forms of situational motivation (intrinsic and identified) and goal reengagement while negatively related to extrinsic forms of situational motivation (external and introjected), amotivation, state rumination, and negative affect experienced at the time of an exercise setback. Second, we hypothesized that after controlling for self-esteem, self-compassion would still be positively and negatively related to the previously mentioned self-regulation outcomes. Finally, we hypothesized that self-compassion would have a stronger association with these outcomes than self-esteem.

Methods

Design and Participants

A total of 105 Canadian adults took part in this online, cross-sectional study. Eligibility was restricted to individuals who could recall an exercise setback that occurred within the last 6 months, to ensure that questions about the setback were relevant and personal. We restricted the setback to something that participants felt was their fault to ensure the situation was perceived as a personal setback. In order to focus on *exercise* goals (and not competitive sport goals), we restricted participation to those with no current competitive sport affiliation. Finally, we restricted our sample to Canadian citizens, between 18 and 64 years of age, who could read and write English, and were free of any injury, which would prevent them from being physically active. Initially, 247 participants signed onto our study website. Of those, 137 were ineligible or decided not to continue, leaving 110 eligible and consenting participants. Five of these participants were excluded due to failure to follow study instructions. Our final sample consisted of 95 women and 10 men ($M_{\text{age}} = 42.94$ years, $SD = 17.18$). Most participants identified themselves as White (81.9%), slightly more than half were married (55.2%), about a third worked full time (31.4%), and had completed an undergraduate degree (32.4%). The sample was physically active, self-reporting an average of 178.80 min ($SD = 162.54$) of moderate-to-vigorous physical activity per week, which exceeds recommended levels (Tremblay et al., 2011). As shown in Table 1, the mean level of self-compassion and self-esteem within this sample was comparable to past self-compassion research (Magnus et al., 2010; Reis et al., 2015).

Procedures

Recruitment, Eligibility, and Baseline Assessment. Upon receiving ethics approval from the University of Manitoba, participants were recruited using advertisements placed at two university campuses, fitness facilities, and community malls within a mid-sized Canadian city as well as social media outlets, such as Facebook and Kijiji. In addition, participants from an unrelated research study involving only women, who had agreed to be contacted about other research, were e-mailed study information. Interested participants were directed to a study website where they saw a brief description of the study and eligibility requirements.

Table 1 Mean and SD of Variables

Variable	Range	<i>M</i>	<i>SD</i>
Self-compassion	1–5	2.99	0.74
Self-esteem	0–30	20.05	5.7
SIMS			
Intrinsic	1–7	4.57	1.47
Identified	1–7	6.17	0.74
Introjected	1–7	4.50	1.5
External	1–7	3.82	1.5
Amotivation	1–7	1.68	0.81
Goal reengagement	1–5	3.99	1.14
State rumination	1–5	3.39	1.25
Negative affect	1–7	3.24	1.58

Note. SIMS = Situational Motivation Scale.

Eligible and consenting participants were prompted to provide self-compassion, self-esteem, and demographic information.

Exercise Failure Recall. Next, participants were asked to recall an exercise setback that they deemed to be their fault and had occurred within the last 6 months. To prompt participants' recall, we asked them to provide an in-depth description. A feature of our survey tracked the word count of participants' description; if participants failed to provide a detailed response (as determined by a minimum word count), they were prompted, once, to provide more detail. Wording from Leary et al.'s (2007) study, where participants recalled a past general setback, was slightly altered to "Think back to a time when you have experienced an exercise failure or setback within the last six months that you consider to be your fault." Participants were provided with sample reasons for exercise setbacks that would constitute *their* fault, such as "you did not make time for exercise." Participants were also provided with examples of exercise setbacks, such as "you set an exercise goal of going to the gym three times a week, but life got in the way and you stopped going." These examples were based on previous self-compassion studies examining responses to setbacks in both academic and sport settings (Leary et al., 2007; Reis et al., 2015). Providing examples of a setback and letting participants otherwise define a setback are consistent with past self-compassion research (Leary et al., 2007; Reis et al., 2015). The 6-month time line not only provided individuals with enough time to have possibly encountered a setback, but also balanced this concern against the risk of time-related recall error. Scenarios recalled within this time frame should elicit the reactions under investigation; individual recall of past transgression (with no specified time line) has been found to evoke affective and social cognitive reactions irrespective of when they occurred, according to functional magnetic resonance imaging data (McLatchie, Giner-Sorolla, & Derbyshire, 2016).

Assessment of Outcomes. Next, participants were asked to complete study questionnaires, which assessed their reactions to the exercise setback. Participants were thoroughly debriefed immediately after completing the study by reading an online script, which explained the aims of the study. Participants were then thanked for their time and provided with a \$5 gift card.

Baseline Measures

Demographics. Participants reported their age, gender, cultural background, marital status, educational background, current employment, and current living location.

Self-Compassion. The 26-item self-compassion scale (Neff, 2003b) was used to measure self-compassion. Using a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*), participants rated themselves on six subscales: self-judgment, self-kindness, isolation, common humanity, overidentification, and mindfulness. These subscales measure the three components of self-compassion: self-kindness (vs. self-judgment), common humanity (vs. isolation), and mindfulness (vs. overidentification). Negatively worded items were reversed scored; a mean was calculated for each subscale. A grand mean was then calculated (Neff, 2003b) to create an overall self-compassion score. Scores on this scale from past research demonstrate test-retest reliability over 3 weeks ($r = .80-.93$) on the six subscales and an internal consistency of .92 (Neff, 2003b). Within the present study, scale items demonstrated high internal consistency with an alpha of .95.

Self-Esteem. Self-esteem was measured using The Rosenberg Self-Esteem Scale (Rosenberg, 1965). This 10-item scale employs a 4-point Likert scale (0 = *strongly disagree*; 3 = *strongly agree*). Negatively worded items were reversed scored, and then, all 10 items were summed. High scores indicate high self-esteem. Past research demonstrates strong internal consistency (.88, .87; Magnus et al., 2010; Mosewich et al., 2011), and other researchers have used this scale to control for self-esteem in self-compassion research (Magnus et al., 2010; Mosewich et al., 2011). Within the present study, scale items showed high internal consistency with an alpha level of .90.

Reactions to Exercise Setbacks

Pursuit of Adaptive Goals. We conceptualized the self-regulatory aspect of pursuing adaptive goals through the pursuit of goals that should be within individuals' best interest and well-being after an exercise setback.

To measure the quality of participants' motivation to reengage in exercise after a setback, an adapted version of the 16-item Situational Motivation Scale was used (Guay, Vallerand, & Blanchard, 2000). This tool uses a 7-point Likert scale ranging from 1 (*corresponds not at all*) to 7 (*corresponds exactly*). The original scale has four sections measuring intrinsic motivation (four items), identified regulation (four items), external regulation (four items), and amotivation (four items). We used an altered 20-item version that adds four items related to introjected regulation (Guerin & Fortier, 2012). To make the questionnaire specific to our research, instructions were as follows: "When you think back to your exercise failure/setback that you experienced within the last 6 months, when you thought about getting back on track afterwards, which of the following reasons for re-engaging in exercise applied to you?" This altered 20-item Situational Motivation scale has shown internal consistencies that are in the acceptable range with Cronbach's alpha of .95, .80, .85, .86, and .77, respectively (Guay et al., 2000; Guerin & Fortier, 2012). Within this study, items of all subscales showed acceptable internal consistency with alpha levels of .87, .80, .67, .79, and .73, respectively.

Taking Reparative Action. We conceptualized taking reparative action through goal reengagement.

Goal reengagement was measured using an altered version of the goal reengagement scale (Wrosch, Scheier, Miller, Schulz, & Carver, 2003), which is a six-item Likert scale that measures the extent to which individuals reengaged in new goals after they faced a setback in their goal pursuits. The scale ranges from 1 (*almost never true*) to 5 (*almost always true*). We slightly altered the

instructions to capture both the possibility that participants may reengage in *new* exercise goals or resume the *same* exercise goals after experiencing the exercise setback rather than their general tendencies to reengage in only a new goal. The scores were summed, and a mean was calculated to determine the overall goal reengagement score. The original six-item scale showed a Cronbach's alpha of .86 (Wrosch et al., 2003). Within this study, the scale showed good internal consistency with an alpha level of .84.

Effective Reactions to the Failure/Setback. We conceptualized effective reactions to a setback through two variables: (a) affective reactions to failure and (b) level of state rumination.

To measure negative affect following an exercise setback, a 20-item negative affect scale used by Leary et al. (2007) was employed. This tool employs a Likert scale ranging from 1 (*not at all*) to 7 (*extremely*). This scale was created to measure the degree to which people experience 20 different feelings, which assess five emotions: sadness (sad, dejected, down, and depressed); anxiety (nervous, tense, worried, and anxious); anger (angry, irritated, mad, and hostile); embarrassment (embarrassed, humiliated, disgraced, and ashamed); and feelings of incompetence (incompetent, worthless, stupid, and self-conscious). A total negative affect score is calculated. To make the scale specific to our research question, the following instructions were given to participants: "Please keep the exercise failure or setback that you just recalled in mind as you respond to the next set of questions. When you think back to how you felt after the exercise setback please indicate the extent to which you experienced each emotion. Please read each question carefully." The wording of these instructions was slightly altered from previous studies using this scale to examine negative affect in different contexts (Leary et al., 2007; Reis et al., 2015). Evidence of acceptable reliability has been shown ($\alpha > .75$; Leary et al., 2007). Within this study, the scale showed high internal consistency between items with an alpha level of .97.

To measure participants' recalled rumination about their exercise setback, the three-item State Rumination Scale was used (Puterman, DeLongis, & Pomaki, 2010). This tool uses a Likert scale ranging from 1 (*not at all*) to 5 (*a lot*). Items were adapted to address an exercise failure or setback. The original items of the scale reflected a Cronbach's alpha of .90 (Puterman et al., 2010). Within this study, the scale showed high internal consistency between items with an alpha level of .90.

Manipulation Check. We reviewed participants' written responses to ensure they were recalling an exercise setback that had occurred within the last 6 months that they deemed was their fault. Five women ($M_{\text{age}} = 27.60$, $SD = 15.1$) failed to follow study instructions (i.e., did not recall an exercise setback) and therefore were excluded from any analyses. Other than gender, all other characteristics of these five participants were not statistically different from the larger sample.

Data Management and Analysis

Recommendations guided data cleaning and preparation (Pallant, 2010; Tabachnick & Fidell, 2007). All assumptions were met before conducting analyses (linearity, normality, multicollinearity, and homoscedasticity). To test Hypothesis 1, a series of bivariate and semipartial correlations was conducted. Semipartial correlations were used instead of bivariate correlations in cases where age was correlated to the outcome of interest, which allowed us to control for age. We considered whether to control

for age because the age range in the present study was larger than past studies (Magnus et al., 2010; Reis et al., 2015). Age was significantly correlated to goal reengagement ($r = -.20, p < .01$) and negative affect ($r = -.56, p < .01$) and was controlled for in analyses with these variables. A series of semipartial correlations and hierarchical multiple regressions was used to test Hypothesis 2. Hierarchical multiple regressions were used instead of semipartial correlations (to allow for the inclusion of both age and self-esteem as covariates) when age correlated with an outcome (goal reengagement and negative affect). To test Hypothesis 3, we used semipartial correlations, while controlling for either self-compassion or self-esteem, and compared the strength of each association.

Results

Preliminary Analyses

The first two authors independently and systematically reviewed the written responses provided by participants (Braun & Clarke, 2006). Responses were coded and then further categorized into two themes: the type of exercise setback and the reason(s) provided. Reviewers then compared and discussed agreement among the themes and codes. Seven different types of exercise setbacks and nine different reason(s) for the participants' exercise setback were agreed upon by the two authors. A Cohen's κ of .78 ($p < .001$) for the type of exercise setback and .73 ($p < .0001$) for the setback reasons suggests substantial interrater agreement (Landis & Koch, 1977). The most common setback experienced by participants was failure to meet an exercise goal (68%), followed by missing one or two exercise sessions (14%), discontinuation of their gym membership/class (10%), pushing themselves too hard resulting in injury (3%), missing gym sessions for a couple of months (2%), not giving as much effort to exercise (2%), and failure to get back on track after traveling (1%). The most common reasons these participants provided for experiencing their exercise setback were inability to prioritize exercise (18%); making excuses (18%); lack of motivation (15%); not making time (6%); too lazy (4%); did not keep to their routine (4%); and reasons categorized as "other," such as too tired, sore, bad mood, or bad weather (17%). Unfortunately, some participants did not provide any reasons why they experienced their exercise setback (18%). Some participants (2%) also noted feelings of shame or guilt about their exercise setback. An example of a setback that one participant provided was, "I set an exercise goal of going to the gym 3 times a week, but I did not continue going because I was alone and did not make enough time for it." (Sally Boyd, personal communication, March 4, 2017).

Overall Results

Descriptive statistics are presented in Table 1. There was support for Hypothesis 1, in that self-compassion was positively associated with intrinsic situational motivation ($r = .32, p = .001$) and identified situational regulation ($r = .29, p = .003$), whereas it was negatively associated with introjected ($r = -.26, p = .01$) and external situational regulations ($r = -.32, p = .001$), amotivation ($r = -.21, p = .03$), and state rumination ($r = -.61, p < .001$). When we controlled for age, self-compassion predicted unique variance in goal reengagement ($r = .27, p = .005$) and negative affect ($r = -.43, p < .001$).

There was partial support for Hypothesis 2. As shown in Tables 2 and 3, after controlling for self-esteem and age (Model 2),

self-compassion was positively associated with goal reengagement ($R^2 = .11, \Delta R^2 = .07; p = .02$) and inversely related to negative affect ($R^2 = .53, \Delta R^2 = .04, p = .01$). Self-compassion was negatively associated with external regulation ($r = -.21, p = .04$) and state rumination ($r = -.39, p < .001$) after controlling for self-esteem. In the case of introjected regulation, an association with self-compassion neared significance ($r = -.18, p = .08$) after controlling for self-esteem. Contrary to our hypothesis, self-compassion did not predict unique variance, over self-esteem, in intrinsic situational motivation ($r = -.00, p = .979$), identified regulation ($r = -.00, p = .921$), and amotivation ($r = .06, p = .547$).

There was a partial support for Hypothesis 3. Self-compassion was associated with goal reengagement ($r = .41, p = .03$) and negatively associated with state rumination ($r = -.39, p < .001$) and external situational regulation ($r = -.21, p = .04$), whereas self-esteem was not associated with any of these outcomes. Self-esteem, but not self-compassion, was associated with intrinsic situational motivation ($r = .26, p = .005$), identified regulation ($r = .24, p = .02$), and amotivation ($r = .26, p = .009$). Both self-compassion and self-esteem were inversely related to negative affect with self-compassion having a stronger relationship ($r = -.31, p = .006$) than self-esteem ($r = -.24, p = .003$).

Discussion

The present study suggests that self-compassion is associated with several indicators of adaptive exercise self-regulation after an exercise setback. Specifically, individuals who were higher in

Table 2 Hierarchical Multiple Regression for Goal Reengagement, Age, Self-Esteem, and Self-Compassion

Variable	Model 1 ^a			Model 2 ^b		
	B	SE B	β	B	SE B	β
Age	-0.02	0.01	-0.26*	-0.02	0.01	-0.37**
Self-esteem	0.04	0.02	0.18	-0.02	0.03	-0.14
Self-compassion				0.63	0.27	0.41**
<i>F</i> for ΔR^2		3.40*			7.62*	

^aModel 1 examined only age and self-esteem effect on goal reengagement. ^bModel 2 examined the additional effect of self-compassion on goal reengagement while controlling for age and self-esteem.

* $p < .05$. ** $p < .01$.

Table 3 Hierarchical Multiple Regression for Negative Affect, Age, Self-Esteem, and Self-Compassion

Variable	Model 1 ^a			Model 2 ^b		
	B	SE B	β	B	SE B	β
Age	-0.03	0.01	-0.37**	-0.03	0.01	-0.34**
Self-esteem	-0.13	0.02	-0.46**	-0.07	0.03	-0.24*
Self-compassion				-0.65	0.25	-0.31**
<i>F</i> for ΔR^2		49.01**			7.75**	

^aModel 1 examined only age and self-esteem effect on negative affect. ^bModel 2 examined the additional effect of self-compassion on goal negative affect while controlling for age and self-esteem.

* $p < .05$. ** $p < .01$.

self-compassion were more likely to recall having set an exercise goal that was self-determined and less likely to recall having set an extrinsically motivated exercise goal after an exercise setback. They also reported higher levels of goal reengagement, less rumination, and negative emotions. Once we controlled for self-esteem, self-compassion was still positively correlated to goal reengagement and negatively associated to external situational regulation, state rumination, and negative affect. However, self-compassion was no longer correlated to self-determined forms of situational motivation or amotivation, and instead, self-esteem was significantly correlated to these outcomes when controlling for self-compassion. These results suggest that self-compassion is a useful perspective that exercisers can take when experiencing an exercise setback that is sometimes, but not always, more useful than having high self-esteem.

Self-Compassion and Situational Motivation

As self-compassion is associated with setting goals that enhance one's happiness and well-being (Neff, Rude, & Kirkpatrick, 2007), it is not surprising that self-compassion was negatively related to extrinsic forms of situational motivation after an exercise setback. According to self-determination theory, these regulations are driven by external factors such as a sense of obligation or to attain a specific outcome (Deci & Ryan, 2000) and are not consistent with taking a self-compassionate approach. This result aligns with research by Magnus et al. (2010) who found, among female exercisers, that self-compassion was negatively associated with extrinsic motivation for exercise (introjected and external). Practically, self-compassion may buffer people against extrinsic exercise motivation, which is associated with negative outcomes including reduced value, investment, and interest in a goal, a greater likelihood of blaming others for negative outcomes, higher levels of anxiety, and poor coping with setbacks (Teixeira et al., 2012).

Although self-compassion was associated with self-determined motivation (intrinsic and identified motivation; Hypothesis 1), when we controlled for self-esteem, self-compassion no longer associated with these regulations, which was inconsistent with Hypothesis 2. This is surprising given that self-compassion has been associated with mastery academic goal setting (Neff et al., 2005), which is aligned with more self-determined motivation and setting goals that are focused on one's health and well-being (e.g., Magnus et al., 2010; Neff et al., 2007). Only one other study has examined self-compassion's relationship with exercise motivation using self-determination theory (Magnus et al., 2010). In both their studies and ours, self-compassion was related to intrinsic motivation (and in our study, all forms of self-determined motivation). However, when the individual contribution of self-compassion and self-esteem was examined, self-compassion no longer made an independent contribution to self-determined situational motivation (intrinsic motivation and identified regulation). It appears that aspects unique to self-esteem contribute to self-determined situational motivation and any contribution that self-compassion makes involves aspects that it shares with self-esteem. This suggests that in some cases, self-esteem may be at least as, if not more, important than self-compassion when it comes to participants' feelings of situational self-determined motivation after an exercise setback. Future research should continue to examine these variables' unique and complementary roles in both a setback or negative situation and in positive life situations.

Self-Compassion and Taking Reparative Action

This study is the first to demonstrate self-compassion's positive relationship with goal reengagement after an exercise setback; this relationship was unique from the influence of self-esteem. Aspects unique to self-compassion, such as the tendency to accurately judge situations without undue self-criticism (Leary et al., 2007), may account for self-compassion's association with goal reengagement following an exercise setback. These findings support research in other contexts, such as academia (Neely, Schallert, Mohammed, Roberts, & Chen, 2009) and among parents raising autistic children (Neff & Faso, 2014). This is an important finding as goal reengagement plays a key role in adaptive self-regulation (Wrosch et al., 2003). Being able to reengage in a valued exercise goal may provide a sense of purpose, increase feelings of self-mastery, reduce stress, and ruminative thoughts (Wrosch et al., 2003). Therefore, having the ability to reengage may alleviate some of the negative consequences associated with an exercise setback. Future research should extend these findings by objectively measuring, by way of accelerometers, an individual's ability to reengage in exercise after a setback.

Self-Compassion and Effective Reactions to a Setback

Self-compassion was inversely related to negative affect experienced after an exercise setback; these results remained when we controlled for self-esteem. These findings align with general self-compassion research (Neff et al., 2005) and add to the two exercise studies that have examined self-compassion and its association with affect (Sirois, 2015; Sirois et al., 2015). Self-compassion's association with adaptive emotions after an exercise setback may have important implications for self-regulation. When individuals experience negative emotions about an event, they may remain focused on this immediate situation, which may undermine their ability to focus on their long-term goal (transcendence; Baumeister & Heatherton, 1996). In addition, they may devote self-regulatory resources to the management of these emotions (Bruyneel, DeWitte, Franses, & DeKimpe, 2009) leaving few self-regulatory resources available for continued goal pursuit (Baumeister, Bratslavsky, Muraven, & Tice, 1998). Indeed, Bruyneel et al. (2009) showed that when people extend self-regulatory efforts to emotion management, they have few resources left to devote to other pursuits like reengaging in an exercise goal. In the present study, self-compassion may have reduced the negative affect experienced by participants after an exercise setback, which may have allowed participants to focus on their long-term exercise goal. Longitudinal research should corroborate this suggestion.

Our findings are the first to demonstrate a negative relationship between self-compassion and state rumination after an exercise setback, and these results remained consistent when we controlled for self-esteem. Studies in other domains (e.g., sport, academics) also show this negative relationship (e.g., Ferguson et al., 2014; Neff et al., 2007). Ruminating about failures can have detrimental consequences to goal progress including self-blame and self-criticism, decreased motivation, and problem-solving (Rimes & Watkins, 2005), all which may make it difficult to reengage in an exercise goal. According to Neff (2003b), mindfulness, one of the three dimensions of self-compassion, may reduce ruminative thoughts. Specifically, it allows individuals to acknowledge their feelings in a situation, without ruminating or overidentifying with these feelings (Neff, 2003b). This pattern of response to a setback,

in the present study, may have allowed participants to accurately perceive when a discrepancy exists between their behavior and their desired goal, and initiate problem-solving to fix their behavior (Brown, 1999) and reengage in an exercise goal. Future research could examine the components of self-compassion independently to understand which are most strongly related to adaptive reactions to an exercise setback. This may provide insight into which aspects of self-compassion may be important to target in interventions designed to improve self-regulation after these types of setbacks (Neff, Whittaker, & Karl, 2017).

Self-Compassion and Self-Esteem

Researchers argue that self-compassion and self-esteem are strongly correlated but can also have unique roles (e.g., Mosewich et al., 2011). We also found these variables to be strongly related ($r = .78$), yet depending on the response to a setback examined, their relationship appeared to be complementary or unique. Self-compassion negatively related to goal reengagement, state rumination, external regulation, and negative affect after accounting for self-esteem, and in the case of negative affect, both variables exerted a significant relationship. However, the unique benefit of self-compassion over self-esteem did not extend to participants' feelings of situational self-determined motivation and situational amotivation, where self-esteem alone offered benefit. Therefore, the present results suggest self-compassion and self-esteem have complementary benefits when it comes to dealing with negative affect, but offer unique benefits for outcomes, such as goal reengagement, situational motivation, and state rumination. Self-compassion may be most beneficial as a buffer against negative reactions (e.g., rumination and negative affect) to an exercise setback; an idea supported by other research (Magnus et al., 2010; Mosewich et al., 2011), and it may be the combination of having high levels of both self-compassion and self-esteem that contribute to the most success after an exercise setback.

Study Strengths

Only four other studies have examined self-compassion in the context of exercise self-regulation (Berry et al., 2010; Magnus et al., 2010; Sirois, 2015; Sirois et al., 2015); two of these examined exercise as a part of a general index of health-promoting behaviors (exercise, sleep, and healthy eating; Sirois, 2015; Sirois et al., 2015), whereas the others focused on self-compassion and exercise (Magnus et al., 2010) or body self-compassion (Berry et al., 2010) among young women exercisers. This study extends this research by examining the self-regulation of exercise among women of a larger age range and among men from a community sample. In addition, this was the first study to examine self-compassion's role in the self-regulation of exercise after an exercise setback. As previous studies point to self-compassion's positive role in dealing with failures in other contexts (academic and sport; Neff et al., 2005; Reis et al., 2015), it is important to examine if these positive benefits also apply to the context of exercise. This study also offers preliminary insight into the complex roles of self-compassion and self-esteem in exercise self-regulation.

Study Limitations

The cross-sectional design did not allow us to determine cause and effect, but instead only provided information on the extent to

which one variable (self-compassion) varies directly or indirectly with another variable (goal reengagement and rumination; Portney & Watkins, 2009). This cross-sectional test of self-compassionate reactions to an exercise setback is an appropriate test of proof-of-concept (Czajkowski et al., 2015) at this early stage of research. This research provides a foundation for more complex future research designs (i.e., experimental design). Researchers should focus on whether increasing individuals' self-compassion leads to greater exercise and whether it does so through promoting adaptive self-regulation. Furthermore, self-compassion interventions have been identified as being most helpful to those who are self-critical and who have lower levels of self-compassion (Leary et al., 2007). Therefore, researchers should focus attention on recruiting individuals who struggle to be self-compassionate.

Second, we asked participants to think of an exercise setback that occurred in the last 6 months. We did not consider variability within this 6-month time frame. Those who recalled a more proximal setback may have felt the postrecall measures were more relevant and may have been able to provide a more accurate response. Future researchers may want to consider a longitudinal approach where they would follow participants over a period of time and measure these outcomes immediately after they encounter an exercise setback.

In addition, the online survey system that was used for this study did not allow us to determine the characteristics of those individuals who were deemed ineligible to participate and compare them to those who were eligible. Other physical activity studies have shown individuals who agree to participate in physical activity research tend to be more physically active than those who do not participate (Harris, Victor, Carey, Adams, & Cook, 2008), and this may have been the case for our study given the high levels of physical activity and self-determined situational motivation for exercise reported by participants. These individuals may have been inherently committed to their exercise goals, compared with those who were ineligible/chose not to participate. Future researchers may want to make special effort in ensuring a wide range of physical activity levels and self-relevance of exercise among their sample.

Finally, although we were seeking both men and women to participate, 90% of the participants were women. This problem is not presently unique (Neff et al., 2005; Sirois, 2015; Sirois et al., 2015). Researchers should focus on recruiting from places where there is a high population of men (i.e., all male gyms) to have a more balanced gender representation.

Conclusion

The results of this study indicate that self-compassion may assist with self-regulating exercise after an exercise setback. Specifically, self-compassion may provide a strategy to deal with negative emotions, decrease rumination, and extrinsic regulation for an exercise goal and reengage in an exercise goal after an exercise setback.

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