Self-Compassion and Risk-Taking in Sport Injury Rehabilitation

by

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A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfillment of the requirements of the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

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Winnipeg

Abstract

Self-compassion, a state characterized by treating oneself with kindness, recognition of common humanity, and mindful awareness of suffering, is an asset in coping with the challenges presented by sport injuries. However, it is not yet known how self-compassion may affect the ways in which athletes approach rehabilitation decisions. Previous literature suggests self-compassion may influence decision-making by either: i) encouraging self-protection, or ii) encouraging authentic expression of preferences and personality. The purpose of this dissertation was to examine whether self-compassion promotes one of these perspectives and how this influences risk-taking in rehabilitation decisions.

This dissertation consists of two studies, both surveying university undergraduates who participate in sports. Participants were presented with a hypothetical sport injury scenario and prompted to describe the amount of risk they would tolerate in deciding when to return to sport, how they would approach the rehabilitation process, and the emotional experiences they anticipated having throughout the process. The aim of the first study was to utilize exploratory factor analyses to validate the use of both previously established and newly created questionnaires, including the hypothetical injury scenario. The aim of the second study was to examine the relationships among self-compassion and the dependent variables of risk-taking, recovery strategy preferences, and emotional experiences. Multiple linear regressions were used to assess these relationships while controlling for potential co-variates like athletic identity, personality, and self-esteem.

Participants higher in self-compassion demonstrated a preference for self-protection. Although self-compassion did not influence the amount of risk an athlete was willing to tolerate in returning to their sport, higher levels of self-compassion were associated with a preference for

rehabilitation strategies that prioritize preservation and protection over accelerated progress. Self-compassion was also associated with greater positive affect, lower negative affect, and lower uncertainty during recovery. These results were distinct from what could be explained by how participants framed their decisions, personality, and self-esteem.

The results of my research support the self-protection perspective of self-compassion in injury rehabilitation decision-making and add evidence that self-compassion is an adaptive coping mechanism in challenging times. Encouraging self-compassion can help injured athletes navigate an emotionally challenging experience without increasing risk-taking.

Acknowledgements

I am overwhelmed by my gratitude for the support I have received over the years from so many people. There is simply not enough space here to thank everybody individually.

This endeavor certainly would not have been possible without the help of my advisor, Dr. Daniel S. Bailis. Thank you for supporting my ideas, helping me to focus my thinking, stopping me straying too far into the deep end when I started getting ahead of myself, and above all else your patience and understanding as I did my best to forget what I was capable of accomplishing.

I am endlessly indebted to my co-advisor, Dr. Adrienne Leslie-Toogood. Thank you for not just opening doors for me, but for first building them, kicking them down, and then holding my hand as you led me through them. Thank you for fiercely advocating for me as a student, as a professional, and most importantly, as a human.

Many thanks to my committee members, Dr. Edward Johnson, Dr. Kristin Reynolds, and Dr. Shaelyn Strachan, for your insights in the development of this project and your encouragement to persevere.

I am also thankful for the support from my friends and colleagues, especially those within the Department of Psychology and the Fraser Health Authority Clinical Psychology Residency Program.

Lastly, words will never be enough to express my thanks to my wonderfully loving family, who have been by my side through the hardest parts of this journey. It seems unfair to me that I should receive individual credit for what has always been a team effort. I could not ask for better role models. I love you.

Table of Contents

Abstract ii

Acknowledgements iv

Table of Contents v

List of Tables viii

Chapter 1: Self-Compassion and Risk-Taking in Sport Injury Rehabilitation 10

Return-From-Injury, Motivational Conflict, and Self-Compassion 11

What We Think About When We Think About Recovery: The Role of Regulatory Focus 12

Expressions of Self-Compassion: Protection or Authenticity? 15

Chapter 2: Literature Review 17

Self-Compassion 17

Sport Injuries 24

Regulatory Focus Theory 29

Athletic Identity 32

The Present Research 36

Chapter 3: Study 1 37

Participants 37

Materials 38

Results 47

Qualitative Feedback 60

Validation of Measures 47

Correlational Analyses 58

Discussion 62

Chapter 4: Study 2 65

Participants 66

Materials 67

Regulatory Focus and Recovery Strategy Preference 68

Perceptions of the Recommended Treatment Plan 69

Procedure 75

Overview of Analysis Plan 75

Results 76

Preliminary Analyses 76

Risk-Taking and Rehabilitation Decisions 82

The Impact of Athletic Identity 93

Discussion 99

Chapter 5: Discussion 103

Limitations and Future Directions 108

Clinical Significance and Impact 113

Concluding Statements 117

References 119

Appendices A-M – Research Instruments 119

Appendices N & O – Additional Analyses 180

Appendix P – Ancillary Discussion 189

List of Tables

Table 1: Descriptive Statistics – Study 1 Variables……...49
Table 2: Descriptive Statistics – Risk-Taking Measures……...53
Table 3: Rotated Factor Loadings – Recovery Strategy Preferences……54
Table 4: Rotated Factor Loadings – Rehabilitation Overadherence Questionnaire (ROAQ)…...57
Table 5: Correlations Among Possible Study 2 Predictor Variables…….59
Table 6: Descriptive Statistics of Aspects of Risk-Taking……70
Table 7: Descriptive Statistics – Emotional Experiences……..72
Table 8: Descriptive Statistics – AIMS-Plus Subscales…….....……...74
Table 9: Factor Structure of the Rehabilitation Overadherence Questionnaire (ROAQ)……..…77
Table 10: Descriptive Statistics – ROAQ……..78
Table 11: Factor Structure of Recovery Strategy Preferences……...79
Table 12: Descriptive Statistics – Recovery Strategy Preferences……80
Table 13: Factor Structure of Aspects of Risk-Taking……..81
Table 14: Descriptive Statistics and Correlations – Risk and Recovery Measures……...83
Table 15: Dimensions of Risk-Taking Based on Self-Compassion, Regulatory Focus, and Personality……..85
Table 16: Preference for Certain Recovery Strategies Based on Self-Compassion and Regulatory Focus……..86
Table 17: Descriptive Statistics and Correlations – Emotional Experience and Coping……...90
Table 18: Emotional Responses Based on Self-Compassion and Regulatory Focus……91
Table 19: Dimensions of Risk-Taking Based on Self-Compassion and Athletic Identity……94
Table 20: Preference for Certain recovery Strategies Based on Self-Compassion and Athletic Identity……...95
Table 21: Emotional Responses Based on Self-Compassion and Athletic Identity……..98
Table 22: Recovery Strategy Preference Based on Self-Compassion and Athletic Identity Interaction Effects……180
Table 23: Intercorrelations Between AIMS-Plus Subscales and Risk-Taking……181
Table 24: Risk-Taking Based on AIMS-Plus Subscales……..182
Table 25: Intercorrelations Between AIMS-Plus Subscales and Recovery Strategy Preference……183

Table 26: Recovery Strategy Preference Based on AIMS-Plus Subscales……..184
Table 27: Intercorrelations Between AIMS-Plus Subscales and Emotional Experience……185
Table 28: Emotional Experiences Based on AIMS-Plus Subscales……186
Table 29: Correlations with Dimensions of Risk-Taking……187
Table 30: Individual Dimensions of Risk-Taking……...188

Chapter 1: Self-Compassion and Risk-Taking in Sport Injury Rehabilitation

Participating in high-level sport is a choice that can often result in physical injury. Although injury rates and types vary across sports (Dane et al., 2004; Lemoyne et al., 2017), sport increases injury-risk for athletes of all ages. Sport-related injuries account for more than 20% of all injuries resulting in emergency department visits by individuals aged 5-24 years old (Burt & Overpeck, 2001), almost two-thirds of injuries among adolescents (Billette & Janz, 2011), and a recent survey of Canadian universities identified 9.3% of athletes suffered a concussion during the athletic year (Bergeron, 2017). Although sport injuries often can be treated without loss to competition time (Powell & Dompier, 2004), they still do limit participation in training and competition at a high rate (Alonso et al., 2009). Powell and Dompier (2004) surveyed collegiate athletic programs to assess how many injuries lead to missing participation and the proportion of athletic treatments dedicated to these injuries. They discovered that 16-22% of injuries resulted in a loss of participation time, while 34-47% of treatments were associated with injuries that caused lost participation time. Injury prevention and recovery is thus an important concern for many athletes.

Sport injuries can also take a toll on athletes' psychological health and well-being. Injuries can present challenges to self-worth and self-esteem (Gustafsson et al., 2008), as well as social and performance stressors (Podlog & Eklund, 2007; Weinberg et al., 2013). Sport injuries have been linked to greater levels of psychological distress, depression, anxiety, tension, and fear, and decreased self-esteem among elite amateur, collegiate, and professional athletes (Schwab Reese et al., 2012). There is some evidence to suggest that these outcomes may be exacerbated by the extent to which an individual identifies with the social role of an athlete (Brewer et al., 1993; Lamont-Mills & Christensen, 2006; Slobounov, 2008). While a strong

athletic identity can have positive competitive and psychological outcomes (Callero, 1985; Horton & Mack, 2000; Verkooijen et al., 2012), one-dimensional identities focused solely around sport have been associated with negative effects on well-being (Brewer et al., 1993; Coakley, 1992; Miller & Kerr, 2002). Not being able to play can be a significant source of stress for athletes and may fuel their motivation to return to sport.

Return-From-Injury, Motivational Conflict, and Self-Compassion

The initial experience of and rehabilitation of an injury is not the only source of distress for athletes, however. Athletes also face challenges when making the decisions of whether, when, and how to return to sport. These decisions can be complicated for both physiological and psychological reasons. First, the risk of re-injury is significantly greater for athletes who return to competition before their bodies are completely healed. For example, one study examined athletes who sustained an ACL injury and received surgery. Those who met a set of strength and performance-based metrics before returning to competition were four times less likely to be re-injured than those who returned without meeting the discharge criteria (Kyritsis et al., 2016).

Second, returning to sport is commonly accompanied by mood disturbance (Morrey et al., 1999), fear (Ardern et al., 2012; Hsu et al., 2017), and re-injury anxiety (Bianco, 2001; Cox, 2002; Evans et al., 2000; Gould et al., 1997; Kvist et al., 2005; Podlog & Eklund, 2006; J. Taylor & Taylor, 1997; Walker et al., 2007). This anxiety can be a significant barrier to otherwise healthy athletes returning to sport (Heil, 1994; Kvist et al., 2005), suggesting that even when the *objective* risk of re-injury may be lower, the *perceived* risk remains an important decisional factor. Thus, an athlete returning from injury may find themselves in the unenviable position of having to choose between options that each have significant negative consequences (i.e., missed

practice/competition opportunities and self-/social disapproval vs. feared and actual re-injury risk) or what is often termed an avoidance-avoidance motivational conflict.

Given these competing concerns, how does an athlete weigh the various risks and benefits, and make the decision of whether and when to return to sport? The broad aim of this dissertation is to examine the role that *self-compassion* plays in shaping these sport injury rehabilitation decisions. Self-compassion takes the concept of compassion – recognition of another's suffering which motivates a desire to help (Goetz et al., 2010) – and directs it toward oneself. Self-compassion is thus a recognition of one's own suffering, acknowledgement that suffering is a normal part of the human experience, and a desire to alleviate that suffering (Neff & Seppälä, 2016). A self-compassionate person is one who, when faced with a loss or challenge, treats themselves with kindness rather than criticism or judgment, recognizes that they are not the only one to face such difficulties rather than feel like they are alone, and is able to attend to their experiences without becoming overwhelmed by them (Neff, 2003a). This dissertation will examine how athletes who are relatively more or less self-compassionate evaluate and contend with the trade-offs between the undesirable status quo of remaining off the field, and the risky option of returning to play.

What We Think About When We Think About Recovery: The Role of Regulatory Focus

As I review in Chapter 2, a substantial body of literature supports that self-compassion is associated with higher well-being in diverse contexts, including sport/exercise and health-related settings (Barnard & Curry, 2011; Macbeth & Gumley, 2012; Mosewich et al., 2011). However, far less research has examined either theoretical or empirical associations of self-compassion with behavioral decision-making, such as the decision whether or when to return to training and competition following an athletic injury. Many factors contribute to a person's decision-making

processes and abilities, such as previous experiences (Juliusson et al., 2005), cognitive biases (Stanovich & West, 2008), sense of commitment (Dietrich, 2010), and stress (Starcke & Brand, 2012). Specific factors that influence sport participation decisions are discussed at greater length in the next chapter. Yet we have little understanding to date of how self-compassion plays into these decision-making processes, in either helpful or unhelpful ways.

To advance such understanding, I propose that regulatory focus theory (RFT; Higgins, 1997) provides a useful framework for understanding the different strategies athletes may use to return to sport after an injury. Regulatory focus theory begins from the hedonistic premise that human decision-making processes are a combination of seeking to achieve pleasure and/or to avoid pain. In general, psychologists have shown that people engage in activities or make decisions that provide a net benefit and avoid those that provide a net cost (Skinner, 1965). Further, if a decision or action seems likely to provide more pleasure than pain, the individual will be motivated to carry out that action, and vice versa (Atkinson, 1957). Researchers in many different areas of psychology have relied on this hedonistic principle to study normal and abnormal emotion, cognitive processes, behaviour and behaviour change, and personal and interpersonal processes (Higgins, 1997). While the simplicity of this framework is elegant, it does not sufficiently describe human tendencies to engage in self-defeating behaviours (Baumeister & Scher, 1988). Further, people generally experience pain more strongly than they experience pleasure (Baumeister et al., 2001). Thus, reductions in pain may not be psychologically equivalent to increases in pleasure when it comes to influencing decision-making, activity engagement, or the value that people attach to those outcomes (Higgins, 1997; Kahneman & Tversky, 1984), and a more comprehensive understanding is needed.

RFT helps to explain some of these phenomena by describing the different ways that a person may try to achieve their hedonistic aims, and how they prioritize their different goals. Higgins (1997) proposed that situations which feature needs for nurturance, make salient a person's sense of ideals and aspirations, and present options in terms of gains and non-gains (e.g., complete this assignment for bonus credit) will contribute to developing a *promotion focus*. This focus will make somebody sensitive to the potential positive outcomes of their decisions, actively choose strategies that match their goals, prioritize "hits" and insure against errors of omission, and experience emotions along the cheerfulness-dejection spectrum.

In contrast, situations that feature needs for safety, security, and stability, suggest a person's sense of obligation, responsibility, and duty, and present options in terms of losses and non-losses (e.g., complete this assignment to avoid being penalized) will contribute to developing a *prevention focus*. Utilizing a prevention focus when making decisions will make someone more sensitive to the negative outcomes, they will seek to avoid mismatches between their behaviours and their goals, emphasize correct rejections and insure against errors of commission, and experience emotions along the quiescence-agitation spectrum.[1]

RFT proposes that although regulatory focus can be induced, individuals will more readily orient themselves toward one or the other. This difference in orientation, their regulatory focus, helps to explain how different people can construe the same decision, with the same given outcomes and probabilities, in different ways. More specifically, RFT can guide this research by specifying the kinds of outcome measures through which focus-differences are expressed in evaluating and choosing between behavioural options, such as their preference for eager, enthusiastic strategies of goal pursuit relative to more vigilant, careful strategies. RFT suggests

[1] See Higgins (1997) Figure 1, "Psychological Variables With Distinct Relations to Promotion Focus ad Prevention Focus" for a visual representation of these relationships.

that an injured athlete with a promotion focus would prioritize the recovery goal of accelerating their return to sport. For example, if the recovery plan consisted mainly of resistance-focused strength training, this athlete might seek out other treatment modalities like yoga, massage therapy, acupuncture, or cryotherapy (e.g., ice baths). They might seek to shorten their recovery time by deviating from their prescribed recovery plan through overadherence[2] (e.g., seeking out excessive, "extra work" they could do to speed their recovery) and be less likely to view a sharply prescribed plan as right, feasible, or effective for them. Meanwhile, an athlete with a prevention-focus might prioritize the recovery goal of avoiding re-injury or making the injury worse. They would be more likely to view a cautious plan as right, feasible, and effective for them: one that involved monitoring their health and progress vigilantly, ensuring they didn't over-exert themselves to cause another injury, adhering strictly to the recommended treatment plan, and avoiding activities that introduce risk.

Expressions of Self-Compassion: Protection or Authenticity?

While regulatory focus can inform the types of behaviours we may expect to see from different athletes, does either focus represent a distinctly self-compassionate approach to sport injury rehabilitation? There are two perspectives on the role of self-compassion that permit hypotheses to be tested in this context: one perspective that prioritizes self-protection and one that encourages authenticity. From the protection perspective, athletes higher in self-compassion will take better care of themselves than do athletes lower in self-compassion. They will be more accepting of the injury and lost opportunities to play (Ferguson et al., 2015) and less influenced

[2] While *overadherence* is essentially a type of nonadherence, the term is used throughout for a few key reasons: 1) for consistency with the instrument used to assess the construct, the "Rehabilitation Overadherence Questionnaire" (Podlog et al., 2013); 2) parallelism with the concept of *overtraining syndrome* (e.g., Kreher & Schwartz, 2012) in which athletes engage in excessive training with deleterious effects; 3) to distinguish from *underadherence* which may represent an effort for self-protection.

by team- or coach-based expectations or obligations, as self-compassion is consistently associated with lower levels of shame (E. A. Johnson & O'Brien, 2013; Zoha et al., 2013). Altogether, from the self-protection perspective, highly self-compassionate athletes should favour prevention-focused strategies and be especially likely to choose staying off the field and following their treatment program as prescribed.

Authenticity, however, reflects the degree to which something is genuine, real, and/or true (Beverland & Farrelly, 2010) and is often characterized by phrases that reflect these ideas, such as "I can be myself around them" and "I've got to do what I feel is right" (J. W. Zhang et al., 2019). Previous research has shown that self-compassion is related to greater subjective feelings of authenticity (J. W. Zhang et al., 2019), as well as successful striving for more authentic resolutions to conflicts (Yarnell & Neff, 2013). When athletes are injured, their athletic identity is threatened or at least temporarily prevented from being expressed. Thus, self-compassion may lead them to strive to restore their athletic identity. Such striving, however, could produce riskier decisions by athletes to return sooner to training or competition, as well as more typically promotion-focused thoughts, feelings, and decisions, such as disappointment at the prospect of continued non-participation, and pursuit of additional/alternative therapies to accelerate recovery. The main theoretical contribution of this dissertation will be to compare the self-protection vs. authenticity perspectives on how self-compassion guides decision-making in a sport rehabilitation context, by using the prevention/promotion-focused strategy distinctions of regulatory focus theory and athletic identity to tell the two self-compassion perspectives apart. Understanding which of these two perspectives better reflects the mechanism by which self-compassion affects decisions can have important consequences for the health and sport psychological coaching of athletes.

Chapter 2: Literature Review

Self-Compassion

Self-compassion is sometimes conceptualized simply as compassion toward oneself, reducing an individual's focus on their own problems and helping them to maintain a more balanced perspective that leaves room for kindness. Self-compassion represents what some refer to as a "hypo-egoic" state, meaning focus is primarily on the present situation rather than on thoughts, motives, or feelings about oneself (Leary et al., 2017). Other hypo-egoic states may include altruism, forgiveness, compassion for others, and love (Farb et al., 2016). As an individual's focus shifts away from themselves, they become better at regulating emotion (Finlay-Jones et al., 2015) and better able to examine a situation objectively and respond in thoughtful and purposeful ways.

Self-compassion research in exercise, health, and sport is in a period of growth. Over the past decade, researchers have studied self-compassion in relation to exercise (Magnus et al., 2010), self-regulation and health (Terry & Leary, 2011), and body image and eating (Ferreira et al., 2013; M. B. Taylor et al., 2015). Meanwhile, a handful of researchers have led the charge in applying self-compassion particularly to work in sport and with athletes. Mosewich et al. (2011) initially presented self-compassion as a potential buffer against critical self-evaluation and distinct from self-esteem in predicting self-evaluative thoughts and emotions. Subsequent research has built on these initial findings with the design of a self-compassion-based intervention for female athletes that effectively managed self-criticism, rumination, and concern over mistakes (Mosewich et al., 2013). Recent scoping reviews (see Cormier et al., 2023; Röthlin, 2019) have chronicled the many ways in self-compassion has been studied in the sport context, including the relationships with performance, well-being, mindfulness, striving, dealing

with setbacks, negative thoughts and emotions, and self-criticism. Self-compassion has been shown to have a positive relationship with well-being (Ferguson et al., 2014), promotes psychological flourishing (Ferguson et al., 2022), encourages healthier coping strategies in response to emotionally difficult situations in sport (Reis et al., 2015), has been presented as a resource to manage challenges associated with perfectionism in sport (Ferguson et al., 2023), protects against negative body image (Pila et al., 2022), mitigates narcissistic and antisocial behaviour in sport (S. Zhang et al., 2024), and athletes commonly utilize self-compassion to support performance and striving in competition (Adam et al., 2021).

Particularly relevant to this research, self-compassion has been shown to help athletes cope effectively with injuries (K. L. Johnson et al., 2022) and is linked to reduced anxiety, worry, and avoidance-focused coping strategies, including among injured collegiate athletes (Casali et al., 2022; Huysmans & Clement, 2017). Teaching self-compassion to athletes can be successful, as interventions have shown effectiveness in helping athletes build their ability to respond compassionately to failure, improve well-being, and increase perceived sport performance (Reis et al., 2019). This has led to the adaptation of intervention programs specifically for a sport context, which have been effective in contributing to increased self-compassion, decreased self-criticism, and improvements in perceived performance (Kuchar et al., 2023).

Self-compassion has also been studied qualitatively, exploring the experiences of athletes who have suffered setbacks in their sport careers (Mosewich et al., 2014). Mosewich et al. (2014) found that the most cited setback was injuries and the athletes in their study highlighted fears of re-injury and ability or performance decline that could be important drivers of self-compassionate decision-making from a self-protection perspective. However, they also

highlighted feeling isolated from friends and teammates, missing out on activities they enjoyed, and lost opportunities to develop and progress as athletes, which could be important drivers of self-compassionate decision-making from an authenticity perspective.

The ways in which the athletes handled these difficulties also represented both he prevention- and promotion-focused strategies. On the prevention-focused side, athletes valued learning to listen to what their body was capable of and accepting that they may need to modify or limit their participation. On the promotion-focused side, they valued focusing on the reasons why they love their sport, celebrating small successes and gradual improvement, and connecting with others who had successfully recovered from injuries as examples of gains they could still strive for within the limits of prescribed rehabilitation. However, athletes also admitted to ignoring practitioner recommendations, engaging in activities that had been prohibited and even prematurely returning to play despite claiming to understand the reasoning behind the prescribed restrictions.

Other qualitative studies have identified that self-compassion could be important for coping with disappointment and injury (Sutherland et al., 2014), examined how self-compassion is developed among athletes (Ingstrup et al., 2017) and conceptualized ways in which self-compassion helps athletes reach their athletic potential, namely through nurturing confidence and encouraging goal pursuit (Ferguson et al., 2014). Recent research has illuminated the ways in which perceptions of self-compassion interact with concepts like masculinity and male athletes' openness to self-compassion as a way to handle challenges (Reis et al., 2022), and sport participation as a form of self-compassion wherein an athlete learns to care for themselves, appreciate their body's capabilities, pursue passions, and promote positive mental health outcomes (Paechter et al., 2025).

In many other contexts, too, research shows that self-compassion is consistently associated with higher well-being (Barnard & Curry, 2011) and lower anxiety, depression, and stress (Macbeth & Gumley, 2012). Individuals who tend to be higher in self-compassion experience more positive affect such as happiness, optimism, curiosity, creativity, enthusiasm, and excitement, and less negative affect such as embarrassment, irritability, sadness, and nervousness (Hollis-Walker & Colosimo, 2011; Leary et al., 2007; Neff, Kirkpatrick, et al., 2007). Interventions that teach self-care self-compassion have been similarly associated with increased positive emotions (S. D. Johnson et al., 2011; Mongrain et al., 2011). However, this existing research both within and beyond the sport and exercise domain has focused extensively on the emotional and motivational aspects rather than the decision-making aspect of coping with setbacks such as injuries. Self-compassion has been shown to predict self-care activities (Jay Miller et al., 2019), which may reflect a preference for prevention-focused decision-making, but without also measuring promotion-focused alternatives and using quantitative methods to assess the extent of these preferences, it is impossible to know which types of decisions self-compassionate individuals prefer.

The most widely used measure of self-compassion is Neff's (2003b) Self-Compassion Scale (SCS). Available in at least 14 languages (Neff & Knox, 2017), the SCS has been used to study self-compassion with respect to a multitude of personal constructs, including psychological well-being (Macbeth & Gumley, 2012), self-esteem (Neff, 2011), motivation (Neff & Seppälä, 2016), health and aging (Allen & Leary, 2014), and body image and disordered eating (T. D. Braun et al., 2016). The SCS has also been used to study self-compassion in the context of interpersonal relationships, including romantic relationships (Neff & Beretvas, 2013) and a variety of prosocial behaviours (Neff & Pommier, 2013). As originally conceptualized, the SCS

assesses six individual aspects of self-compassion. Three of these are seen as positive aspects of self-compassion, consisting of self-kindness, common humanity, and mindfulness, while the other three are situated as the opposing negative aspects – self-judgment, isolation, and over-identification. In developing the SCS with an undergraduate sample, Neff (2003b) showed strong positive correlations among the positive aspects (r = .77 to .87) and among the negative aspects (r = .84 to .91), and moderate to strong negative relationships when comparing positive aspects to negative aspects (r = -.46 to -.81).

Neff's (2003b) findings provided initial support for the proposed six-factor structure, though this has more recently been the topic of significant debate. Beginning with Muris (2015), some authors have argued that the negative aspects are not reflective of "true" self-compassion and thus do not warrant inclusion in a scale that purports to measure self-compassion. Muris argued that the proposed negative aspects of self-compassion are in fact highly similar to self-criticism, social withdrawal and loneliness, and self-absorption and rumination. These traits have all been associated with negative mental health outcomes (Lyubomirsky & Noel-Hoeksema, 1995; Rubin & Coplan, 2005; Zuroff et al., 1990), which Muris argued artificially increases the theoretically important association between self-compassion and psychopathology. A meta-analysis revealed a stronger link between psychopathology and the negative aspects of self-compassion than the positive ones (Muris & Petrocchi, 2016), lending support to this concern. Other researchers have echoed the sentiment that an overall self-compassion score does not accurately describe the construct. Some have suggested instead a two-factor model that distinguishes between self-compassion and self-criticism (J. Costa et al., 2016; López et al., 2015) or self-coldness (Brenner et al., 2017), while others have argued that the negative aspects of self-compassion merely reflect trait neuroticism (Pfattheicher et al., 2017).

Neff (2016a, 2016b) responded to these criticisms by arguing that the SCS is designed to assess self-compassion based on her definition of the construct, which she says has always included the negative dimensions. However, speaking in terms of three dimensions simplifies writing, allows the academic reader to reach the same understanding, and makes the concept more digestible to the general public (who will be on the receiving end of self-compassion-based teaching and interventions), even if it does sacrifice some specificity. Neff argues that the six components of self-compassion mutually influence each other and illustrate "how individuals emotionally respond, cognitively understand, or pay attention to their suffering" (Neff, 2016a). Neff believes a self-compassionate person is one who responds in the positive ways and not in the negative ways, therefore necessitating the inclusion of the negative aspects in any measurement of self-compassion. Support for this argument includes recognition of how biological responses from the sympathetic and parasympathetic nervous systems interact. Gilbert's (2005) model of social mentalities suggests that self-compassion triggers the "rest-and-digest" parasympathetic nervous system, while self-criticism activates the "fight-or-flight" sympathetic nervous system. As these two systems interact (Porges, 2001), Neff (2016a) argues that the two aspects of self-compassion should be allowed to similarly influence each other. The research in this area is still nascent, and while there continues to be some disagreement over how findings should be interpreted (Muris et al., 2019), there is some evidence to support the notion that biological systems reflect self-compassion and interact in a way that justifies including both positive and negative dimensions in the conceptualization of the construct (Neff, Long, et al., 2018).

This debate has also included the psychometric structure of the SCS, with researchers disagreeing on the best way to model and score the SCS. Some authors have questioned whether it is appropriate to specify six distinct subscales, or if there is a more appropriate way in which to describe the structure of the SCS. One study that used community, experienced meditator, and

clinically depressed samples (M. J. Williams et al., 2014) examined self-compassion as a single overarching factor (i.e., all items loaded onto one factor), as six factors (consistent with Neff's (2003a) definition), and as a hierarchical structure (i.e., six factors loading onto one overarching factor). The researchers found that only the six-factor structure was an acceptable fit for the data, but only in the community sample and only if "acceptable" was liberally defined. These results suggested that the six-factor model was the best of the three models tested, but a more robust measure of self-compassion was needed (M. J. Williams et al., 2014).

Neff (2016b) responded to this new research by suggesting that perhaps a bi-factor model (Reise, 2012; Reise et al., 2010) would be particularly appropriate to measuring self-compassion. A bi-factor model allows for one common factor (e.g., self-compassion) to explain a significant portion of the variance in item responses but also allows for the inclusion of additional group factors (e.g., self-kindness, common humanity, or overidentification) in the model (Neff, 2016b). Importantly, Neff suggested that this type of model would more accurately reflect her conceptualization of self-compassion as "more than the sum of its (subscale) parts" (p. 267). While the research in this area is still evolving, a bi-factor understanding of the SCS may be poised to take over as the dominant conceptualization. Some researchers have found that a bi-factor model is adequate in some samples, though the original six-factor structure remains superior (Neff et al., 2017). Others have found that a bi-factor structure provides the best fit for the data (Cleare et al., 2018; Tóth-Király et al., 2017), suggesting the remaining questions may be a matter of determining how many general factors are appropriate for inclusion in a bi-factor model – some authors suggest one (Neff, 2019; Neff, Tóth-Király, et al., 2018) while others argue for two (Brenner et al., 2017; H. Zhang et al., 2019).

These studies have been criticized, however, for following flawed methodology (Marsh et al., 2023). In this review, Marsh et al. (2023) tested several different models and determined that the previously proposed model which combines six-first-order factors and two global factors does not accurately fit the data. Instead, they support using any one of several different approaches, including 1) a total self-compassion score, 2) six subscale scores, and 3) distinguishing between positive and negative dimensions of self-compassion. In the context of my research, the six subscale scores are not relevant to any of my research questions. I therefore chose to utilize the first approach where the subscales are combined to calculate an overall self-compassion score.

Sport Injuries

There have been several theoretical models developed to predict and prevent injury (U. Johnson & Ivarsson, 2017), some of which incorporate psychosocial factors among the many predictors. The most cited among these is the stress-injury model (Williams & Andersen, 1998, 2007). This model presents two primary factors that reflect the risk of an athlete becoming injured: the magnitudes of their stress responses and their appraisals of potentially stressful situations. These factors are seen as responses to potentially stressful situations, and are each influenced by personality, history of stressors, and coping resources.

In their update of the stress-injury model, J. M. Williams and Andersen (2007) conceptualize *personality* factors as comprising multiple characteristics described by previous research. These characteristics include psychological hardiness (e.g., curiosity, willingness to commit, seeing change as a challenge and opportunity for growth, and having control over one's life; Kobasa, 1979), locus of control (Rotter, 1966), sense of coherence (Antonovsky, 1985), trait anxiety (Spielberger, 1966), and achievement motivation (i.e., the needs to succeed and to avoid

failure). Williams and Andersen (2007) describe *history of stressors* as including major life events (e.g., moving to a new city, the death of a loved one), daily hassles (e.g., loneliness and adjusting to a new climate after moving), and previous injuries. Previous injuries were included in the model due to the increased risk of injury if an athlete has not fully recovered, and difficulties such as anxiety if the athlete is not psychologically prepared to return (J. M. Williams & Andersen, 2007). *Coping resources* is a broad term the authors use to describe both environmental (e.g., social support) and personal resources, (e.g., emotion regulation and nutrition).

A meta-analysis examining sport injury prediction and prevention research (Ivarsson et al., 2017) was framed in the context of the stress-injury model. This analysis showed that stress responses (r = 0.27, 80% CI [0.20, 0.33]) and history of stressors (r = 0.13, 80% CI [0.11, 0.15]) had the strongest associations with injury rates, while there was only a marginal association between personality traits and injury rates (r = 0.01, 80% CI [-0.01, 0.03])[3]. Additionally, all seven of the intervention studies included in the analysis showed lower rates of injury in the treatment group than in the control group. Although this model presents a reasonable fit for existing data, more recent models have been forwarded in the hopes of addressing previous limitations and building on the model's strengths, to mixed results.

Later models, such as the Biopsychosocial Model of Stress and Athletic Injury and Health (Appaneal & Perna, 2014), have built upon the stress-injury model by identifying psychophysiological stressors (e.g., negative life events, intense physical training) as antecedents to physiological (e.g., stress hormone responses, suppression of the immune system) and

[3] There is some research from a non-sport context that suggests there may be slightly stronger negative relationships between conscientiousness, agreeableness, and extraversion, and involvement in workplace and traffic accidents causing injury (Clarke & Robertson, 2005).

behavioural responses (e.g., impaired self-care, poor sleep) – all three of which have been related to negative health outcomes such as increased injury rates or prolonged recovery. This model improved on the stress-injury model by recognizing the contributions of physiological responses but is relatively limited in its recognition of psychosocial factors that influence injury. These include individual coping resources (e.g., self-compassion) and cultural or environmental factors that contribute to injuries. For example, a team culture or atmosphere that neglects recovery and requires adherence to training programs regardless of current physical state may contribute to more severe injuries later down the line (Tibbert et al., 2015). Many of the same factors that contribute to acute injuries (i.e., personality, history of stressors, and coping) are believed to contribute to overuse injuries (Aicale et al., 2018), as are low acceptance of complaining about pain or an expectation to play even when injured (Tranaeus et al., 2014).

The literature in this area suggests that self-compassion may be related to the likelihood of sustaining an injury. The present research, meanwhile, is centered around the separate but related issue of how self-compassion impacts recovery, given that an injury has already occurred. While these issues are separable, they are related insofar as both previous injuries and training decisions while injured are contributing factors in subsequent injuries. The challenge with incorporating self-compassion into these models is that it occupies multiple roles (e.g., it may contribute directly as a coping resource, as well as indirectly through moderation of recovery processes). Further, the role of self-compassion is ambiguous – will it generally serve to prolong recovery periods or shorten them? This research is intended to first resolve the ambiguity problem, which may make it easier to address the multiple-role problem. These issues will be addressed further in the general discussion section (Chapter 5).

Risk-taking in sport can lead to both injury and reinjury. For example, male junior tennis players who were more likely to take risks in general were also more susceptible to overuse injuries (Van der Sluis et al., 2017). Assessing the risk of an activity is a subjective process that varies from person to person and is part of the reason why some athletes choose to participate in "extreme" sports such as rock climbing or snowboarding, while others prefer curling and golf. This risk-assessment is shaped by cognitive, emotional, and social influences (Fuller & Drawer, 2004). Cognitive influences may include sensory information such as the physical environment (e.g., swimming in open water may be seen as higher risk than swimming in a pool) or the mental processes through which the individual interprets or responds to such information (e.g., a novice participant may perceive there to be more risk than a more experienced one). The particular information that the athlete attends to and internalizes may affect the perceived risk of the activity. These perceptions develop over time and can change with the presentation of new information (Fuller & Drawer, 2004). Therefore, in the present research it was important to ensure that the risks and recovery experiences athletes considered were perceived as realistic and concerning, and not unfamiliar in the context of other injuries they had experienced or seen peers experience.

There are also emotional factors that both influence and are influenced by perceived risk. Some researchers have suggested participating in high-risk activities may be an effort to redirect attention away from low self-esteem (Castanier et al., 2010), though the support for this idea is mixed (Klinar et al., 2017). Athletes who have been injured in their sport often feel more vulnerable to future injuries (Deroche et al., 2007), a fear that may develop due to a new recognition of the risks associated with their sport, and a lack of confidence in their ability to avoid injury (Short et al., 2004). These shifts in perspective result in negative appraisals about

their sport, particularly that the environment is threatening and the risk of being re-injured is high, leading to feelings of anxiety and fear that negatively impact the rehabilitation process. Their fears about being re-injured can result in the athlete not adhering to treatment recommendations (A. H. Taylor & May, 1996) and feeling uncomfortable with challenging themselves. When the athlete does return to competition, they can expect their performance to suffer thanks to these negative psychological outcomes (J. H. Dunn, 1999; Evans et al., 2000).

The amount of risk an athlete perceives can be influenced by the people and environment that surround them. Athletes sometimes face pressure from coaches and teammates to compete while injured, being lionized and admired (Wright et al., 2014). This can skew their perception of risk, either by making them believe there is not as much risk as there truly is, or by adding incentives. While this may help buffer against the negative outcomes associated with high perceived risk and fear of injury, it may lead athletes to return to competition before they are fully recovered. Meanwhile, athletes who feel satisfied with social support given from athletic therapists are less likely to report symptoms of depression or anxiety at return to play (Yang et al., 2014). Athletes do not go through the rehabilitation process alone, and their social experiences help to shape their risk perception.

Some athletes have a higher tolerance for risk and need more stimulation than others (Jack & Ronan, 1998; Wagner & Houlihan, 1994). Risk tolerance is sometimes seen as comparable to a personality trait, consistent with the concept of openness to experience from the Five-Factor Model of personality (P. T. Costa & McCrae, 1985; McCrae & Costa, 1987; McCrae & John, 1992). Most of the research in this area has supported the notion that those who participate in risky sports tend to have higher levels of extraversion and openness to experience, and lower levels of conscientiousness and neuroticism (i.e., they do not react as strongly when

presented with a potentially threatening stimulus; Tok, 2011). Injured athletes higher in neuroticism perceive themselves as more susceptible to subsequent injuries (Deroche et al., 2007). Athletes who are open to trying new things and remain unfazed by possible challenges are likely to perceive situations as less risky.

While perception of risk is clearly a complex and multidimensional construct, in the case of sport injury rehabilitation it ultimately comes down to a binary decision of whether to return to participation or not. Therefore, in addition to measuring relevant values and goals (i.e., through questions related to self-protection or authenticity) and behavioural strategies (i.e., through questions related to prevention- or promotion-focus, or overadherence), asking athletes simple questions about the timing of their return to sport could provide insight into how self-compassion may push an athlete into one decision or the other. By simple questions, I mean how soon after their injury, at what level of certainty of re-injury, and as opposed to what possible consequences of re-injury within a given range would they return to participation. If self-compassion encourages self-protection, athletes may choose not to return despite objective indications and medical advice that they should. If it encourages authenticity, then they may choose to return despite objective indications and medical advice that they are not ready.

Regulatory Focus Theory

The dichotomy of gain-attainment versus loss-prevention is seen in individual behaviours across many different realms of life. An employee who is trying to get a promotion and move up the corporate ladder will behave differently from the one who is simply trying to avoid losing their job. The single person who is seeking companionship will behave differently from the one who wants to avoid rejection and preserve their self-esteem. Many important decisions, including returning to sport after an injury, could be seen in either way. Therefore, it is important and

beneficial to have a theoretical framework for understanding whether or when a person's behaviours will be intended to achieve a gain or to protect what they have.

Regulatory Focus Theory (RFT; Higgins, 1997) meets this need by proposing that all individuals attempt to reduce discrepancies between current states and desired end-states but may employ different strategies to do so. Sometimes these strategies focus mainly on promotion (i.e., advancement, growth, accomplishment) and sometimes mainly on prevention (i.e., maintenance of protection, safety, and responsibility). Of course, as the end goal is always to achieve greater consistency between current and desired states, there is some overlap to be expected. For example, someone whose goal is to improve their physical health may choose to begin exercising (promotion focus) as well as quit smoking (prevention focus), and previous research has shown a small correlation between promotion- and prevention-focus in a given scenario (Higgins, Friedman, Harlow, Idson, et al., 2001).

Higgins and colleagues (1997) further demonstrated that individuals typically have a bias toward one focus or the other, though they do not adopt solely one focus for every decision in their life, and that individuals can be induced to adopt a particular focus (Freitas & Higgins, 2002; Higgins, Friedman, Harlow, Idson, et al., 2001). The effect of regulatory focus has been incorporated into many types of psychological research and theory, as decision-making processes are relevant across many domains. Regulatory focus has been studied in the business world in the context of negotiations (Appelt & Higgins, 2010), consumer behaviour (Laufer & Jung, 2010; Pham & Chang, 2010), and the performance and structure of organizations (Brockner & Higgins, 2001; R. E. Johnson et al., 2010; Wallace et al., 2009), as well as work-related emotions, perceptions, and attitudes (Kruglanski et al., 2007; Markovits et al., 2008; Tseng & Kang, 2008). Regulatory focus has also been studied in health-related fields both from a policy communication

perspective (Ludolph & Schulz, 2015), and individual behaviours (Friedman-Wheeler et al., 2010). Other areas where RFT has been studied include message framing for purposes of persuasion (Yi & Baumgartner, 2009), leadership motivation (Kark & Van Dijk, 2007), and trust and privacy (Wirtz & Lwin, 2009).

Previous research has shown that regulatory focus influences risk-taking, and that the effect is typically large. Hamstra and colleagues (2011) demonstrated that risky driving behaviours were positively associated with promotion-focus and negatively associated with prevention-focus. Physicians tasked with making medical decisions were more likely to make riskier choices if they had a promotion focus than if they had a prevention focus (Veazie et al., 2014). Individuals with a promotion focus show a bias toward risky responses on signal detection tasks (Crowe & Higgins, 1997), and a greater percentage of individuals with a prevention-focus will choose the more conservative of two presented options (Peng et al., 2019). Evidently, regulatory focus is a substantial and important influence in any domain or process that involves the interpretation of information, self-regulation, or decision-making, such as in the case of an injured athlete's decision to return to play.

The evidence from the research in this area suggests that prevention or promotion focus can be assessed by asking participants about both their preferences for certain treatment approaches and how soon or under what conditions they would return to play. By measuring a participant's self-compassion along with their general and specific regulatory-focus tendencies, we can better understand how self-compassion might guide their return-to-play decisions, as well as their attitudes toward treatment interventions.

Athletic Identity

Another concept that elucidates self-compassion's function as protection versus authenticity is athletic identity. A person's athletic identity was originally defined as "the degree to which an individual identifies with the athlete role" (Lantz & Schroeder, 1999). This definition of the construct included social (e.g., "Most of my friends are athletes"), cognitive (e.g., "I have many goals related to sport"), and affective (e.g., "I feel bad about myself when I do poorly in sport") dimensions of identity. Subsequent authors have slightly modified or refined that definition (Good et al., 1993; Horton & Mack, 2000; Hurst et al., 2000; Lantz & Schroeder, 1999; Martin et al., 1995; Smith et al., 1998). Cieslak's (2004) definition of the construct – "the degree of importance, strength and exclusivity attached to the athlete role that is maintained by the athlete and influenced by their environment" (p. 39) – endeavors to combine and reflect the important aspects of each of these previous definitions.

Issues associated with identity in sport have been covered extensively. This includes athletic, sport, exercise, and fan identities and their associations with a litany of personal and social outcomes, including sport motivation, level of commitment toward sport participation, and injury and mood disturbance among many others (Cieslak, 2004). Regardless of the identity being studied, it has consistently been shown that many people consider sport and sport participation to be a central part of who they are as individuals, and an important predictor of behaviour. Athletic identity also seems to interact with coping factors, as athletes higher in self-compassion and social support experience less psychological distress during times when athletic identity is disrupted (C. J. Hayes et al., 2023).

Much of the research in this area has utilized the Athletic Identity Measurement Scale (Brewer et al., 1993). The AIMS was shown to be a valid and reliable measure of athletic

identity, consisting of ten items that were summed to create a single value that would reflect strength of athletic identity. This measure came under some scrutiny, however, as the unidimensional construction of the measure was seen to be inconsistent with the theoretical definition of the construct that includes social, cognitive, and affective dimensions. Subsequent analyses of the measure (Brewer & Cornelius, 2002; Hale et al., 1999; Martin et al., 1995, 1997) supported the argument that the AIMS was not capturing the nuance of the construct as intended and needed to be utilized as a multidimensional model. This body of research eventually led to the development of a seven-item version of the scale that reflected three dimensions of the construct (Brewer & Cornelius, 2002).

Despite these improvements, there were still some concerns that the AIMS was still limited in its conceptualization of athletic identity and did not allow for research of athletic-related (i.e., exercise, fan) identities. These deficits inspired the development of the AIMS-Plus (Cieslak, 2004), a 22-item measure that assesses athletic identity along five factors: positive affectivity, negative affectivity, social identity, self-identity, and exclusivity. The development of this questionnaire highlighted that the internal components of identity (i.e., positive and negative affectivity, and self-identity) are relatively more influential than the other, external components of identity (i.e., social identity and exclusivity). This distinction is relevant to the present research as self-compassion is more likely to interact with the internal components by regulating affect and reducing the focus on the self than it would on the external components – how the individual is perceived by others and the singularity of their identity. It should be noted, however, that while these external components account for a smaller portion of athletic identity, they are not entirely unimportant to the present research. The impact of inability to participate

due to injury can be potentially magnified for those whose identity is solely athletic and can serve as a barrier to many of the social aspects of sport.

In the context of this research, the inclusion of athletic identity provides an independent standard for responding that is in line with the goal of authenticity. It should correspond with more promotion-focused responding in the sports-injury context and can act as a benchmark against which the different perspectives of self-compassion can be compared. Specifically, by including athletic identity in the same study as self-compassion, we can see whether self-compassion functions similarly or in contrast to athletic identity, and whether its relationship to recovery decisions is additive or overlapping with that of athletic identity.

Passion for Sport

Overlapping with athletic identity is the concept of passion. Passion is "a strong inclination toward a specific object, activity, concept or person that one loves (or at least strongly like), highly values, invests time and energy in on a regular basis, and that is part of one's identity" (Vallerand, 2015, p. 33). These are several of the same dimensions that are included in the concept of athletic identity, where people have a strong interest in their sport, invest significant time and energy, and derive social and emotional satisfaction from their training and participation. Passion is often considered to exist in two forms: 1) "harmonious" passion, where a person is free to choose to engage with their passion, but is able to do so in a way that integrates and aligns with other elements of their identity and values, and 2) "obsessive" passion, in which people experience an uncontrollable urge to engage with their passion and it begins to conflict with other important aspects of the person's life (Vallerand, 2015). Passion tends to affect a range of outcomes including cognitive functioning, emotional experiences, well-being, health, and creativity, with harmonious passion being associated with the more adaptive

outcomes and obsessive passion being associated with the less adaptive outcomes (see Vallerand, 2015).

Pertinent to this research, passion seems to affect a person's experiences when they can or cannot engage with their passion (see Vallerand, 2015). Evidence suggests that harmonious passion is positively associated with positive affect and negatively associated with negative affect during and activity engagement, with the opposite being true for obsessive passion. Research examining the emotions people experience when they are prevented from engaging with their passion reveals that obsessive passion is positively associated with negative emotions while harmonious passion is not. Seemingly, harmonious passion allows for other interests to fill the void left by not being able to engage with the object of the passion while obsessive passion leads people to fixate on the fact that they are being kept from the thing they enjoy and to experience significant distress over this.

While passion seems to take these two forms and can impact people differently, for the context of this study it is important to summarize the overall body of research. As Vallerand (Vallerand, 2015) describes:

> First, being prevented from engaging in the passionate activity is not a pleasant situation if someone is passionate about the activity. The results with positive affect show that neither harmonious nor obsessive passion is *positively* correlated with positive affect under such circumstances…Second, being prevented from engaging in the passionate activity leads to some emotional suffering, especially if obsessive passion is involved (p. 171-172).

In this research the important factor for consideration is whether participants are passionate enough about a sport for being prevented from participating to cause some distress. If a research

participant plays a game of pick-up basketball with their friends once a week but is not passionate about the activity and is more interested in socializing afterward than they are the game, their experience of being injured and being forced to watch from the sidelines will be very different from somebody who is deeply passionate about their sport.

The Present Research

The present research was designed around the use of a hypothetical injury scenario to assess rehabilitation decision-making and strategy preferences. The dissertation consists of two related studies. The first study was designed to develop and validate the scenario and the research instruments to be used. This included both quantitative and qualitative feedback regarding the appropriateness of the injury scenario, participants' perceptions of the recommended treatment plan, and how effective the scenario was in eliciting the types of emotional responses of concern that were intended. By validating the injury scenario, I was able to establish the appropriate measures for evaluating the key variables of interest and remove potentially confounding variables such as participant disagreement with the plan or lack of engagement with the scenario.

The purpose of the second study was to replicate the first study and introduce self-compassion as a predictor of decision-making and strategy preferences. Further, by including established measures of athletic identity, regulatory focus, and rehabilitation overadherence, I was able to provide a means of comparing functional similarities between them and self-compassion and deciding on the best interpretation in line with either the self-protection or authenticity perspectives described in Chapter 1. This included assessing risk-tolerance, preferred approaches to recovery, and experiences during the recovery process.

Chapter 3: Study 1

The aim of the first study in the overall research plan was to validate both the previously existing and newly created measures for their use with a population of university undergraduates who participate in sport. Ensuring that the measures captured the intended constructs and are internally consistent, as well as identifying any items that did not function as intended, was necessary to establish the battery of measures that would be used with an athletic population in Study 2. The main goal was to develop an account of a hypothetical injury scenario that participants could respond to, as well as validating a measure to identify whether a person's sport represents a passion of theirs, the appropriateness of certain criteria for making return-to-play decisions, and the measures of different rehabilitation strategies.

Participants

Participants were recruited through the introductory psychology course at the University of Manitoba in exchange for partial course credit. Participant recruitment and data collection took place in March-April of 2021. Recruitment materials indicated that participants should have participated in organized sport within the past twelve months. The definition of "organized sport" was intentionally left broad to ensure adequate sample sizes and to capture a range of experiences. While this means some of the participants may be less engaged or invested in sport, steps were taken, as described later, to ensure that participants were still passionate about their sport and being forced to sit out of competitions would be appropriately distressing. Participants were asked to identify up to three sports in which they currently participate or have recently participated and describe the frequency and competitive nature of their participation (see Appendix A). A total of 238 students registered for the study. Surveys were excluded from data analysis if they were incomplete (n = 13), had a significant amount of missing data (n = 5), or the

participant took longer than 24 hours to complete the survey (n = 1). Some surveys (n = 9) were excluded due to some combination of two or more of the following: two failed engagement checks; no listed sport participation; no listed similar injury experience; or admission of low effort in completing the survey. After these exclusions, the final sample for data analysis consisted of N = 206 surveys.

The final sample of participants ranged in age from 16-39 years old (M = 19.5, SD = 2.7). Participants identified their gender in the following ways and proportions: Man (n = 66; 32.0%); Woman (n = 135; 65.5%); Non-binary (n = 2; 1.0%); It's complicated (n = 1; 0.5%)[4]. A meta-analysis of gender differences in self-compassion research showed that males had slightly higher levels of self-compassion than females, but the effect is small (Yarnell et al., 2015).

Materials

Passion Identification

A four-item measure (Appendix B) assessed whether participants consider the primary sport listed to be a passion of theirs (Marsh et al., 2013; Vallerand et al., 2003). Scores above the midpoint (i.e., ≥ 4 out of 7) were used to represent an activity that is considered a passion.

Hypothetical Injury Scenario Immersion

This research relied on the use of a hypothetical scenario which was presented to participants and designed to elicit emotional responses and give context for the rehabilitation decisions to be made. Hypothetical scenarios are often used in psychological research to gather information in a laboratory setting or learn about how people believe they would respond to scenarios which may be difficult to fabricate. Hypothetical scenarios have been used to study topics directly relevant to the present research, such as how self-compassion affects reactions to

[4] For an account of the problems with binary gender measurement and guidelines for best practices in psychological research, see Cameron & Stinson (2019).

distressing events including sport-related failures like being responsible for a team loss (Leary et al., 2007; Reis et al., 2015), and making sport injury rehabilitation decisions (Chan et al., 2011).

A brief script describing a hypothetical injury scenario was created for the purposes of this research:

> Imagine that you are a serious recreational athlete who has suffered a knee injury and had ACL reconstruction surgery. This is a surgery to replace a torn Anterior Cruciate Ligament, which is a major ligament in your knee. Your doctor's projected timeline for your return to health (i.e., normal function) is 9 months, and return to any type of training or competition in your sport could be in the range of 8 – 12 months. With injuries of this type, there is a risk of re-injury. However, after 6 months of progressive physical therapy, you are feeling reasonably well, if not 100% recovered yet. You decide to contact your doctor about your personal risk of re-injury if you return to sport at this point in time, now.

This scenario was designed to closely replicate realistic possibilities regarding recovery, training, and competition outcomes based on common injury narratives among athletes. The term "recreational athlete" was chosen to distinguish from a professional who may have additional financial or career incentives, or even contractual obligations, that would further complicate the decision-making process. The implications of these decisions are discussed in later sections. While the script was created from scratch specifically for this research, it is consistent with similar scripts that have been created for similar studies (e.g., Chan et al., 2011).

Previous research has shown that imagined scenarios are useful and effective in helping distinguish between how high- and low-self-compassionate people respond to scenarios like getting a poor grade on a test, forgetting their part while performing on a stage, or, most relevant

to this study, being responsible for losing an athletic competition for their team (Leary et al., 2007). However, because this study utilized an imagined scenario, rather than recollection of an experienced event, the believability of the scenario and its ability to evoke an emotional reaction were important. Two items each were used to assess how vividly participants were able to imagine the scenario (e.g., "As you try to imagine this scenario happening to you, does it seem more real or more abstract?") reverse-scored from 1 *(More real)* to 7 *(More abstract)*, and how much concern they would feel if they were faced with the scenario themselves (e.g., "If this scenario were really happening to you, how worried would you be about your recovery timeline?") scored from 0 *(A little or not at all)* to 4 *(Extremely)*. They were also asked to identify whether they had ever experienced a similar situation, the most similar situation they had experienced, positive and negative aspects of that experience, if an injury of the type described would interfere with their sport participation goals, and how disruptive the injury would be to their goals (see Appendix C).

Rehabilitation Measures

The hypothetical injury scenario presented a highly simplified version of a typical treatment and recovery plan. The purpose of this is to provide a starting point against which participants could make their own decisions on how to approach their recovery. Some athletes may choose to do more than is recommended, others may choose to do less; some may choose to return sooner than recommended, others may choose to delay their return beyond the recommendation. The recommended plan, however, needs to be perceived as reasonable at least at a very basic level to be effective for use in the following study. For example, if the recommended rehabilitation plan after major knee surgery was to apply a superficial bandage, 2-3 days of rest, and then a full return to play, would a slower, more cautious approach indicate

that self-compassion was encouraging this person to take a self-protective approach? Or would it simply mean that the original treatment plan was unrealistic to begin with?

To assess participants' perceptions of the prescribed rehabilitation plan, a ten-item measure (Appendix D) was created based on a framework from the Theory of Planned Behaviour (TPB; Ajzen, 1991), according to questionnaire construction guidelines from Fishbein and Ajzen (2010). The TPB proposes that an individual's intention to engage in a behaviour is the result of a combination of their attitude toward the behaviour, the subjective social norms the individual observes regarding the behaviour, and the amount of control of the behaviour the individual believes they can exert. Attitude was assessed using four items (e.g., "Adhering to the recovery plan recommended to me by my physician would be…" where 1-7 = Unreasonable-Reasonable), subjective norms with two items (e.g., "Most people like me who suffered a similar injury would adhere to their physician's recommended recovery plan" where 1-7 = Unlikely-Likely), perceived behavioural control with two items (e.g., "I am confident that I could adhere to my physician's recommended recovery plan" where 1-7 = False-True), and intention with two items (e.g., "I intend to adhere to the treatment plan recommended by my physician" where 1-7 = Not at all-Completely).

Research instruments based on the TPB are typically scored by separating each aspect of the theory into its own subscale. I have chosen to do something different from most other scales by combining all items into one overall score and interpreting all the factors as a complex of intentions and supporting beliefs that reflect a participant's overall perception of the plan. The reasons for this are two-fold: 1) the purpose of the instrument is to evaluate whether participants view the recommended treatment plan favorably, rather than identify the specific degree of influence of attitudes, norms, perceived control, and intentions; 2) people who are higher on one

dimension tend to also be high on the others. The question of whether their intention to follow the treatment plan is guided primarily by positive attitudes, perceptions of social norms, or perceived control is less relevant to this research than whether they have a positive perception of the treatment plan overall.

Ten items were created to identify recovery strategies consistent with either a prevention or promotion regulatory focus, scored on a 5-point scale where 1 = “Very unlike my approach” and 5 = “Very much like my approach”. Six items were written to be consistent with a prevention focus (e.g., “My main focus would be preserving my health and functioning of my knee”) and four items were written to be consistent with a promotion focus (e.g., “My main focus would be recovering my health and getting back to sport participation as quickly and fully as possible”). Previous studies that have measured people’s intentions to engage in certain behaviours have utilized questionnaires consisting of 3-7 items (Baumann et al., 2007; Fishman et al., 2020; Goode & Harris, 2007; Inder et al., 2022; Kaczmarek et al., 2015; Keszey, 2020).

Risk-Taking Measures

Five self-report items were created to quantify the amount of risk participants would tolerate in making return-to-play decisions (see Appendix E). These included the probability of re-injury, consequences of re-injury in terms of lost progress, severity of re-injury in terms of quality of participation, predictability of re-injury, and the point in the expected recovery timeline, in months, when they would choose to return. For example, the item measuring tolerance for probability of re-injury was, “At what level of probability would you decide to return to participating in your sport? In other words, if the doctor said your probability of re-injury was less than _____%, you would decide to resume participating now.” The item assessing time to return was, “Given the above description of both typical recovery from ACL

surgery and your personal recovery to date, at what point in time between 6 months and 12 months would you expect to return to participating in your sport?" As an extreme example for illustrative purposes, a participant with a high risk tolerance might indicate they were comfortable with a high probability they would get hurt again, a major setback in their recovery, re-injury significantly impacting their ability to participate, the cause of their injury being the direct result of regular sport activities (e.g., a baseball pitcher whose injury is caused by high effort throwing), and would choose to return as early as possible. On the other extreme, a participant who is less tolerant of risk may report they were only comfortable returning to play if there was a low chance of getting hurt again, re-injury would represent only a minor setback in recovery, would minimally impact their ability to participate, the cause of the injury was an unlikely event that was outside the range of normal sport activities and was unlikely to happen again (e.g., a baseball pitcher whose injury was caused by a collision with a teammate), and choose to delay their return.

It is important to reiterate that this approach and these measures were previously untried. One objective of this study was to test these novel measures in an independent sample before utilizing them in the main study. The factors that influence return-to-play decisions are complicated and although the recovery process often involves a progression through distinct stages of medical recovery, solitary training, training with teammates with no contact, to full practice, the final decision to complete the recovery by returning to competition is ultimately binary (i.e., "Yes, I will return to play today" vs. "No, I am not yet ready to return to play today"). I therefore treated the decision as binary and the creation of these measures represent an effort to evaluate the criteria that different people might use to guide that decision.

Rehabilitation Overadherence

If an athlete feels a strong desire to return to sport as quickly as possible, even if it means taking additional risk in doing so, they may also be tempted to make attempts to accelerate their recovery. This desire may be particularly salient for athletes with a strong athletic identity, where their sense of self-esteem, purpose, and social networks are closely tied to participating in their sport. Athletes may sometimes deviate from the recommended treatment plan by doing more than recommended, known as overadherence. The Rehabilitation Overadherence Questionnaire (ROAQ; Podlog et al., 2013; Appendix F) is an established measure that was developed specifically for the purpose of assessing these behaviours in a sport injury context and includes factors that resemble promotion-focused self-regulation of sport injury rehabilitation. Because the previous measures of prevention and promotion focus as derived top-down from theory were also new to this study, including this scale provides concurrent validity using an established bottom-up measure in this domain. The ROAQ consists of six items related to behaviour scored on a 1 (Never) to 5 (Always) Likert scale, and four items related to cognitive aspects of overadherence scored 1 (Strongly Disagree) to 5 (Strongly agree). The scale produces scores related to two factors: ignoring practitioner recommendations, and attempting expedited rehabilitation, calculated by averaging items on the two subscales. In previous research employing the scale with a population of injured collegiate athletes, both subscales displayed acceptable internal reliability with Cronbach's α coefficients of 0.86 and 0.75, respectively, and confirmatory factor analyses reveal an acceptable fit for the two-factor model ($\chi^2(34) = 35.84$, CFI = .99, goodness-of-fit index = .94, RMSE = .05; Podlog et al., 2013).

Qualitative Responses

Participants were asked to describe any additional questions they might have for their doctor in deciding when to return to participation, as well as any other pieces or sources of information they would consider in making their decision (see Appendix E). These questions were included to capture any frequently mentioned concerns that may have been missed with the other measures. Participants responses were captured within a text box on the survey form, and there were no restrictions placed on their response length or format.

Planned Data Analysis

The purpose of the first study was to ensure that the questionnaires sufficiently captured participant concerns and considerations in their decision-making. This included collecting both quantitative and qualitative reflections of participants' experiences when posed with the hypothetical injury scenario.

The analysis plan was designed to achieve particular goals: i) ensure the reliability and validity of the measures to be used in the second study, including the factor structure of the measures as relevant; ii) establish correlations among the variables of interest so as to identify relevant co-variates for inclusion in regression models, and iii) incorporate qualitative feedback regarding the hypothetical scenario and risk-taking measures to better capture the most salient concerns of the participants, as necessary.

Ensuring reliability involved assessing the internal consistency of the measures, while evaluating validity was done through exploratory factor analysis. Exploratory, rather than confirmatory, factor analysis was chosen because several of the measures were being newly created for this study and there were no previously assumed factor structures to the instruments. Also, should additional factors organically emerge from the data, I wanted to allow those factors

to be captured in the later analyses. However, in cases where the factor structure was not entirely clear and could be interpreted in a way that was consistent with previous research using the instrument, preference was given to the previously established structure.

Pearson correlations among the variables of interest were used to identify potential covariates. A threshold of $p < .05$ was used to identify statistically significant correlations. Skewness and kurtosis statistics were used to ensure that each continuous variable was normally distributed and would be appropriate for calculating a correlation, and no outlier data points were identified.

Qualitative feedback was analyzed using a form of thematic analysis that is still basically positivist, rather than reflective or interpretive, on the researchers' part. Braun and Clarke (V. Braun & Clarke, 2021) refer to this type of thematic analysis as the "coding reliability" (p. 6) approach, which in this case was intended to use qualitative data to ensure satisfactory coverage of a topic area by the experimental scenario and quantitative measures, as one part of their validation in this otherwise quantitative research. In this case, "themes" involve minimal interpretation by the researchers beyond grouping participants who have said nearly the same thing in slightly different ways, as will become apparent in the results. Participant responses were gathered and organized into similar thematic groupings, then the frequency of responses reflecting a certain theme was tallied. These groupings were discussed and agreed to between myself and my primary advisor, with the intention to examine any similar statements that were made by more than a few participants for possible revision to the scenario and measures in Study 2.

Results

In this section I will report the data collected, beginning with the quantitative data. First, I will report the descriptive statistics of standardized research instruments to determine their suitability for this research context. Second, I will analyze the new scales developed for this research, including reliability and exploratory factor analyses, to identify which items suitably capture participants' attitudes toward treatment recommendations. Although not all details of the treatment plan are specified, the general description (i.e., surgery and progressive physical therapy, a return-to-play timeline of approximately nine months) must present at least an overall degree of realism or else deviations from the plan would represent a lack of trust in the treatment plan, not an expression of self-compassion or regulatory focus. Third, correlational analyses were used to establish the criterion validity of the scenario and measures in an independent sample prior to running the main study. Ensuring the hypothetical scenario accurately reflects a believable injury scenario (i.e., can be vividly imagined) and evokes realistic reactions (i.e., causes meaningful concern) enhances the ecological validity of the subsequent study. Finally, qualitative data were used to identify frequent concerns or questions that were not sufficiently addressed by the scenario or that indicated the scenario was not reflective of participants' experiences. If similar questions or concerns about the scenario were repeatedly raised, these could be incorporated into a revised version of the scenario. Each of these steps was used to inform the measurement strategy to be used in Study 2, increasing the confidence that the study's conclusions about self-compassion are due to neither misspecification of the measures of risk-taking in sport injury rehabilitation nor an unrealistic or inappropriate hypothetical injury scenario.

Validation of Measures

In this section I report on the validity of both the previously established measures and the newly developed research instruments. For each measure, I have reported the means, standard deviations, skewness, kurtosis, and an estimation of reliability for the measure (see Table 1). The most widely used measure of reliability, Cronbach's α, has been the focus of some debate over the best method to use to assess reliability. Some have argued that α requires restrictive assumptions that are unlikely to be met, and that a more robust measure would be McDonald's ω (T. J. Dunn et al., 2014; A. F. Hayes & Coutts, 2020). McDonald's ω, meanwhile, is limited by its inability to calculate scores for scales that consist of only two items and is functionally equivalent to α when the necessary assumptions have been met. As described in the footnote to Table 1, in almost all cases the measurement scales met the requirements such that alpha and omega were equal. Given that two scales consisted of two items, I am choosing to report Cronbach's alpha.

As shown in Table 1, a few of the scales displayed lower internal consistency than the commonly cited threshold for acceptability of $\alpha = 0.70$. Among these were the Concern scale, which may be explained by the scale consisting of only two items, and the preference for promotion-focused strategies subscale, which is an exploratory measure newly developed for this research. Previous authors have argued that alphas between 0.60 and 0.70 are acceptable for exploratory research (Hair et al., 2014; Nunnally & Bernstein, 1994). The reliability metrics for the established ROAQ measure were notably lower than expected based on previous research. This issue was explored further through a factor analysis procedure described later in this section.

Table 1

Descriptive Statistics – Study 1 Variables

Measure	*n*	Minimum	Maximum	Mean	SD	Skewness	Kurtosis	α[5]
Passion Scale	206	1.00	7.00	4.56	1.74	-.59	-.48	.92
Vividness	207	1.00	7.00	4.14	1.71	.01	-.82	.74
Concern	207	1.00	4.00	2.82	0.69	-.12	-.52	.68
Treatment Plan Perceptions	207	3.30	6.90	5.44	0.86	-.32	-.92	.81
Ignoring Recommendations	207	1.00	3.83	2.31	0.58	.43	-.49	.62
Expediting Recovery	207	1.00	4.25	2.75	0.76	-.21	-.35	.62
Prevention-Focused Strategies	206	1.83	5.00	4.07	0.67	-.50	-.47	.80
Promotion-Focused Strategies	206	1.00	5.00	3.50	0.75	-.32	-.11	.61

[5] Calculations of McDonald's ω were highly similar, except for the "Ignore Practitioner Recommendations" subscale, where ω = .86. McDonald's ω for Vividness and Concern could not be calculated due to only consisting of two items.

Finally, as shown in Tables 1 and 2, the skewness and kurtosis statistics for each of the Study 1 variables fell within the range of acceptability, satisfying the appropriate assumptions for the later correlational analyses.

Passion Identification. The design of the present research plan is based on the premise that participants have an emotional investment in the hypothetical injury scenario. By asking participants to identify a sport they are passionate about, we can increase the likelihood they will be invested in the decisions they are asked to make. As shown in Table 1, the 4-item Passion scale displayed high internal consistency within this sample. The listed sport was considered a passion of the participant's if their mean score on these items was equal to or greater than 4.00 (the midpoint of the 7-point scale). Among the respondents, 67.8% (n = 139) identified the first listed sport as a passion of theirs, including that they spend a lot of time doing the activity, they love the activity, it is important to them, and they see it as a passion of theirs. The distribution of scores was negatively skewed to a moderate degree (Skewness = -.59), indicating that the sample contained a large share of participants who were passionate about their sport. Overall, these findings suggest that a majority of the sample was heavily invested in and cared about sport participation, supporting the assumption that they would be engaged with the presented scenario and the hypothetical decisions they were asked to make.

Hypothetical Scenario Immersion. Similar to the assumption that participants would be engaged with the research questions if they involved an activity they were passionate about, also it was important to ensure that participants found the hypothetical injury scenario immersive and evocative. Two items were used to assess how vividly participants could imagine the scenario, which displayed good internal consistency, as shown in Table 1. There was a large correlation between how easily participants could imagine the scenario and how real the scenario seemed, *r*

= 0.589, $p < .001$. These two items were therefore combined into a single score to represent "vividness", scored 1-7. Participants reported a moderate level of vividness. Those who had experienced a similar situation before ($n = 48$) imagined the scenario more vividly ($M = 4.93$, $SD = 1.85$) than those who had not ($n = 156$, $M = 3.89$, $SD = 1.62$), $t(202) = 3.733$, $p < .001$, $d = 1.03$, 95% CI [0.487, 1.578]. Two items were also used to assess the level of emotional concern the scenario would cause for participants, which displayed slightly lower consistency. There was a large correlation between how worried participants would be about the outcome and how preoccupied they would be with their decision while waiting to see the doctor, $r = 0.513$, $p < .001$. These items were combined into a single score to represent "concern", scored 0-3. Participants reported experiencing a very high level of concern ($M = 2.82$, $SD = .70$). Prior experience of a similar situation had no relationship to their degree of concern, $t(202) = 0.795$, *ns*, $d = 0.091$, 95% CI [-0.135, 0.318].

I also explored the impact of participants having experienced a similar scenario beforehand as a predictor of risk-taking. Comparing these groups showed that whether a participant had previously experienced a similar scenario was not significantly correlated with any of the risk-taking variables, and there was no difference between the groups in overall risk tolerance ($t(202) = -.806$, $p > .05$, Cohen's $d = -.133$, 95% CI [-0.457, .191]).

The purpose of these analyses was to rule out the possibility that the hypothetical injury scenario could produce different results for participants who either had previously experienced the scenario or could imagine it more easily vs. those who had not or could not. These findings suggest there is no reason for concern that scenario responses depended on either experience or imagination ability.

Perceptions of the Recommended Treatment Plan. The items related to treatment-adherence attitudes, norms, and intentions displayed good internal consistency. Each dimension of treatment perceptions was significantly positively correlated with each of the other dimensions (r = .18-.55, $p < .01$), supporting the decision to combine all items into one overall score. Participants scored highly on their overall perception of the described treatment plan, suggesting that it accomplished the goal of presenting to the participants a plan that was reasonable and appropriate. If evaluated at the level of each dimension of the TPB, participants reported positive attitudes toward treatment behaviours (M = 5.64, SD = 1.03), perceptions that the treatment plan is in line with social norms (M = 5.61, SD = 1.16), a high degree of perceived control (M = 5.54, SD = 1.19), and a positive intention to engage in the treatment plan (M = 5.56, SD = 1.27). When asked if the recommended plan was too cautious or too aggressive, 70.0% of respondents described the plan as "about right" (M = 3.94, SD = 0.81).

Risk-Taking Measures. Five items were created to assess participants' willingness to assume risk. These items reflected the probability, level of consequence, level of severity, and predictability of re-injury (measured as percentages), as well as the amount of time they would wait before returning to their sport (measured in months). The timeline item was reverse scored so that lower scores (e.g., 6 months) represented a greater degree of risk tolerance than higher scores (e.g., 12 months). To assess the possibility that all five items represented a single risk-taking construct, I standardized the scores and found that they displayed an acceptable level of internal consistency (α = 0.70).

I used principal axis factoring to assess how the individual items mapped onto underlying constructs (Fabrigar & Wegener, 2012). Principal axis factoring of the five items also showed that they reduced to a single factor (i.e., Eigenvalues greater than 1) that explained 38.1% of the

Table 2

Descriptive Statistics – Risk-Taking Measures

Measure	n	Mean	SD	Minimum	Maximum	Skewness	Kurtosis
Aggregated Risk-Tolerance	206	33.85	17.85	0.00	88.75	.49	.07
Time to Return	203	8.90	1.64	6.00	12.00	.21	-.52

variance in scores, although the timeline item had a lower factor loading than the other four items (factor loading = .17 vs. factor loadings = .51-.77). This pattern of factor loadings suggested that the five items should not be combined into a single score, as it is not clear they reflect the same latent variable. Therefore, the first four items (which were reported on the same percentage scale) were averaged to calculate an aggregated percentage-risk score. The timeline item, meanwhile, was treated separately as it still asks a question that is important to this study (i.e., when a participant will expect to make the binary decision to return to play) but exists on a different scale than the other items. The means, standard deviations, and ranges of these measures can be found in Table 2. In Study 2, these metrics can be used to compare participants' risk tolerance and decision-making as a function of self-compassion.

Recovery Strategy Preferences. Ten items were created to reflect prevention- and promotion-focused rehabilitation strategies – six reflective of a prevention-focus and four reflective of a promotion-focus. Participants rated various recovery strategies on how similar they would be to their own approach to rehabilitation. Participants who have a stronger regulatory focus would be expected to endorse adoption of rehabilitation strategies consistent with their focus. The items describing Prevention-focused recovery strategies displayed a good level of consistency ($\alpha = 0.80$), while the items describing Promotion-focused recovery strategies displayed questionable consistency ($\alpha = 0.61$). Participants rated both the Prevention-

Table 3

Rotated Factor Loadings – Recovery Strategy Preferences

Recovery Strategy Preferences Item	Factor loading	
	1	2
Factor 1: Prevention Focus		
1. My main focus would be my health and functioning of my knee	**.59**	.20
3. I would adhere to my doctor's recommendation of time away from participating in my sport, regardless of how I was feeling	**.62**	-.03
4. I would wait as long as necessary to feel 100% recovered before undertaking any sport-related activities	**.73**	-.09
7. I would closely monitor my pain and symptoms in the hope of not making my situation worse through my activities	**.56**	.28
8. I would seek to avoid re-injury at all costs	**.56**	.08
9. My motto during this time would be, "Better safe than sorry."	**.73**	-.14
Factor 2: Promotion Focus		
2. My main focus would be recovering my health and getting back to sport participation as quickly and fully as possible	.05	**.64**
8. I would look for every opportunity to hasten my recovery and return to participating in my sport as quickly as possible	-.14	**.56**
9. I would seek out additional treatments and exercises (e.g., cryotherapy, yoga) to recover more quickly	.19	**.62**

Note. N = 207. The extraction method was principal axis factoring with an orthogonal (Varimax with Kaiser Normalization) rotation. Factor loadings above .40 are in bold.

focused recovery strategies (M = 4.07, SD = 0.67), and the Promotion-focused recovery strategies (M = 3.50, SD = 0.75) as reasonably similar to how they would expect to behave.

Using principal axis factoring, two factors were extracted – consistent with the proposed structure of the items. Nine of the ten items loaded onto only one factor (> 0.40), consistent with the intended structure, while one item ("My motto during this time would be, 'You miss 100% of the shots you don't take.'") did not load onto either (see Table 3). A second analysis, with this item dropped, indicated that the remaining items continued to load onto two factors in the anticipated pattern.

As noted above, the four Promotion-focused strategies items displayed questionable internal consistency. One possible explanation for this is the relatively small number of items. A second is that the wording of the item was confusing enough to be misinterpreted and affect participants' responses. While item 4 was positively correlated with items 1 and 2, it was not significantly correlated with item 3 (and any correlation that did exist was negative), suggesting this may have been the case. A third possibility is that it was capturing a separate construct from that of the other items. A factor analysis of the four Promotion-focused strategy items (which should conceivably reduce to one single factor – preference for promotion-focused strategies) instead produced two factors, with items 1-3 loading onto one factor and item four loading onto the other[6]. Considering these possibilities, the poor item was dropped from further analysis and use in Study 2, providing a final set of six items describing prevention-focused strategies and three items describing promotion-focused strategies. After the poor item was dropped, the internal consistency of the remaining three items was slightly higher than the four-item version of the scale (α = 0.64).

[6] Item 2, in fact, loaded onto both factors.

Rehabilitation Overadherence. As shown in Table 1, participants reported a moderate likelihood of ignoring their physician's recommendations, which was negatively correlated with their perceptions of the treatment plan (see Table 5). They also reported a moderate likelihood of attempting to expedite their rehabilitation, which was positively correlated with how much concern they would feel about their injury rehabilitation timeline. These patterns are conceptually coherent and provide support for the construct validity of the measures within this sample.

As mentioned above, the items of the ROAQ displayed lower than desirable internal consistency within this sample. To better understand why this may be the case, I conducted a factor analysis to explore the possibility that there was a third factor that better suits the data. The original research with the ROAQ proposed a two-factor structure, reflecting the likelihood that an individual would "Ignore practitioner recommendations" (Ignoring) and "Attempt an expedited rehabilitation" (Expediting). Using principal axis factoring with varimax rotation, replicating the original development of the measure, a third factor, "Hiding information" (Hiding) emerged (based on Eigenvalues greater than 1). This suggests that perhaps a three-factor structure would be a better fit for this sample than the two-factor structure.

However, this is arguable as the loading patterns were not entirely clear. Three items loaded onto what would presumably be the Hiding factor, though this included an item that also loaded onto the Expediting factor and was more consistent with that concept ("How frequently would you try to catch up with other athletes who are further ahead in their rehabilitation?"), and one of the items expected to load onto the Ignoring factor instead did not load onto any. These three factors accounted for 16.1%, 15.5%, and 11.1% (total = 42.6%) of the variance, respectively. When a two-factor structure consistent with previous research was forced, the

Table 4

Rotated Factor Loadings – Rehabilitation Overadherence Questionnaire (ROAQ)

ROAQ Item	Factor loading	
	1	2
Factor 1: Ignoring		
1. How frequently would you ignore your physician's advice to avoid pushing through unwanted pain?	**.51**	.17
2. How frequently would you ignore your physician's recommendations to avoid specific exercises or activities?	**.54**	.17
3. How frequently would you avoid reporting pain to your physician?	**.60**	.11
4. How frequently would you hide pain about your injury from doctors or other rehabilitation experts?	**.74**	.05
5. How frequently would you ignore your physician's recommendations to avoid "doing too much too soon" in your rehabilitation?	**.67**	.20
8. In thinking about my rehabilitation, I think that my family or teammates would be concerned if I ignore my physician's advice to limit the rehabilitation exercises I perform	-.27	.14
Factor 2: Expediting Recovery		
6. How frequently would you try to catch up with other athletes who are further ahead in their rehabilitation?	**.44**	**.40**
7. How frequently would you perform more rehabilitation exercises than your physician recommends?	.24	**.51**
8. In thinking about my rehabilitation, I think it is usually better to do too much rehabilitation than not enough	-.09	**.66**
9. In thinking about my rehabilitation, I believe I must progress as quickly as possible in order to avoid losing physical fitness	.13	**.47**

Note. N = 207. The extraction method was principal axis factoring with an orthogonal (Varimax with Kaiser Normalization) rotation. Factor loadings above .40 are in bold.

pattern was largely similar (see Table 4). All but one of the Ignoring items loaded onto that factor, three items loaded onto the Expediting factor, and the last Expediting item loaded onto both. These two factors accounted for 22.6% and 11.6% (total = 34.2%) of the variance. Overall, the data collected from this sample adequately replicated the original structure of the instrument, even if a slight variation may have performed slightly better. The lack of clarity provided by the data may have contributed to the lower than anticipated internal consistency scores that were observed earlier. It was not evident that the three-factor was such a better fit that it was worth deviating from the previously established structure. In the interest of maintaining consistency with other research using the same scale, the original two-factor structure was preferred and used in Study 2.

Correlational Analyses

Bi-variate correlations were used to identify relationships among variables to be included in Study 2 (i.e., engagement, treatment plan perceptions, prevention- and promotion-focused rehabilitation strategies, rehabilitation overadherence) and measures of risk-taking. There were three main questions to be answered with these analyses: 1) Does the new prevention strategy measure predict higher value placed on the physician-recommended plan? 2) Is there an expected correspondence between the new recovery strategy measures and the established ROAQ measure? 3) Do the new strategy measures also predict risk preferences in expected ways?

As shown in Table 5, the preference for prevention-focused recovery strategies was positively correlated with treatment plan perceptions, while there was no relationship between preference for promotion-focused strategies and treatment plan perceptions. Also, there was a negative correlation between treatment plan perceptions and intention to ignore practitioner recommendations and no relationship between perceptions and intention to expedite recovery.

Table 5

Correlations Among Possible Study 2 Predictor Variables

Variable	Passion	Vividness	Concern	Treatment Plan Perceptions	Ignore Practitioner Recommendations	Expedite Recovery	Prevention-Focused Recovery Strategies	Promotion-Focused Recovery Strategies	Aggregated Risk Tolerance	Time to Return
Passion	--									
Vividness	-.011	--								
Concern	.216**	-.224**	--							
Treatment Plan Perceptions	.084	.018	.205**	--						
Ignore Practitioner Recommendations	-.021	.106	-.058	-.217**	--					
Expedite Recovery	.071	.095	.148*	-.107	.355**	--				
Prevention-Focused Recovery Strategies	-.051	-.055	.101	.408**	-.397**	-.183**	--			
Promotion-Focused Recovery Strategies	.234**	.059	.331**	-.015	.134*	.409**	-.094	--		
Aggregated Risk Tolerance	-.006	-.008	.015	-.287**	.188**	.214**	-.319**	.188**	--	
Time to Return	.178*	.062	.015	-.093	.134	.224**	-.269**	.232**	.134	--

Note: * $p < .05$, ** $p < .01$

The relationships shown in Table 5 also show that the newly developed recovery strategy measures correlate with the ROAQ measures in the anticipated ways. Preference for prevention-for promotion-focused strategies was positively associated with expediting. These results further support organizing the recovery strategy items in this way. Finally, the new recovery-strategy measures also predicted risk-taking in the expected ways, with prevention-focused strategies predicting lower risk tolerance and a longer recovery timeline, and promotion-focused strategies predicting higher risk tolerance and earlier return to sport.

Qualitative Feedback

Participants were asked to describe any special circumstances factors impacting their current sport participation, whether they had experienced a similar injury scenario to the hypothetical one presented, their most similar experience, how experiencing a similar injury would affect their current participation plans, other questions they might have for their doctor, and any other sources of information they may consider when making their return-to-play decisions.

As data were collected in March-April 2021, the most commonly cited special circumstance affecting current sport participation was the COVID-19 pandemic (mentioned by 25.1% of participants). Other circumstances cited by more than one participant included recent retirement from sport, often due to leaving high school sports (6.3%), time restrictions due to school, work, or other demands (4.8%), one or more of their usual sports being out-of-season (1.9%), other injury or illness (1.9%), participating in sports non-competitively by mainly for exercise/recreation (1.9%), and anxiety, low motivation, or other mental health concerns (1.4%). Additionally, 18.8% reported there were no special circumstances affecting participation, and 37.7% left the field blank. A total of 23.3% (n = 48) of participants reported experiencing a

situation like the described hypothetical injury scenario. While not a majority, this subgroup was large enough to permit analyses (reported subsequently) of between-group differences in other quantitative response-measures to the scenario, among those with versus without a similar prior experience. Those with a similar prior experience also reported a wide range of most-similar experiences, including experiences identical to the described scenario, other musculoskeletal injuries (e.g., torn ligaments, sprains, breaks), concussions, and other illnesses that caused missed playing time and/or lengthy rehabilitation.

Participants were asked what other questions, if any, they would have for their doctor in the hypothetical scenario. The most common questions were whether there were any ways to expedite or speed recovery and what the cost or impact of re-injury would be (each mentioned by 7.7% of participants). Other common questions included what impact the injury would have on their long-term health and life outside of sport (6.8%), what strategies could be employed to prevent re-injury (4.3%), what extra precautions could be taken that would allow for continued or safer participation (4.3%), whether their ability to participate and perform would return to the same level as prior to the injury (3.9%), the likelihood or probability of re-injury (3.4%), and the anticipated timeline to return (2.9%). Finally, 7.7% of participants indicated they would have no further questions while 43.5% left the field blank. When asked what other pieces or sources of information they would consider in deciding when to return to participation, 9.2% reported they would seek out the experiences of other athletes who had been in a similar situation. Other responses included second opinions from other health care professionals but also from coaches, teammates, and family (7.2%), the time left in the current season or upcoming events and competitions (5.4%), how healthy they feel (2.4%), mental health (1.9%), and how competitive they are in their sport (e.g., whether they have a chance to play professionally; 1.9%). Thirteen

participants (6.3%) indicated they would not seek out other sources of information, while 45.4% left the field blank. These responses provided perspective on the extent to which the totality of participants' considerations would be covered by the standardized quantitative response measures.

Discussion

The aims of this study were to validate the hypothetical injury scenario and to cross-validate the new and established response measures. These goals were accomplished. The hypothetical injury scenario developed for use in this study was effective in creating a vivid and distressing sense of engagement among participants. The hypothetical scenario was shown to be ecologically relevant as participants were able to vividly imagine the scenario, more-so among the portion of the sample who had experienced a similar injury themselves, and both groups of participants reported finding it distressing.

There was no other similar situation the participants identified that would be a more valid scenario as indicated by the wide-ranging scenarios experienced and described by participants. Here, it is worth highlighting that the timing of this research coincided with the COVID-19 pandemic, during which many people's opportunities for sport participation were significantly limited. This was the most cited "special circumstance" that affected the extent to which participants were currently engaging in their sport. The purpose of this research, however, was to explore athletes' responses to injuries, not to environmental factors that present barriers to participation. Therefore, I decided not to revise the hypothetical scenario to include that context.

While several participants indicated that they would consider other sources of information, these perspectives were not so prevalent as to suggest they would be more appropriate for consideration than a physician's recommendation. Further, a majority of the

sample identified the sport they participate in as a passion of theirs, supporting the notion that they were contemplating injuries in a sport-context that they are passionate about.

One pattern that did emerge was the proportion of participants who reported concerns related to both their long-term health and sport performance as relevant to their decision-making. Some of these questions included concerns such as, “How will this affect my ability to go about my normal life outside of exercising? Is there going to be any permanent damage if I choose to push the limits of my recovery?”, “How would the injury be affecting my performance? How will my injury affect me in my future activities?”, and “What would be the risk to normal function if I returned to the sport earlier than the timeline?” Based on these concerns, I decided to slightly modify the description of the hypothetical scenario for Study 2 so the description of a return to full health would also include a return to normal functioning and performance.

Participants reported a wide range in terms of the amount of risk they would be willing to tolerate. Again, this suggests that the hypothetical scenario worked as intended to avoid ceiling or floor effects. If, for example, all participants had expressed that they would not tolerate any risk, then a different hypothetical scenario would have been needed for Study 2. The purpose was to force participants into making a difficult decision where they could stand by whatever choice they made, and the scenario appeared to do that, given that the range of expressed choices in the whole sample was so wide and balanced near the midpoint of each scale.

The descriptions of sample behaviours that would represent prevention- and promotion-focused rehabilitation strategies were effective in reflecting the different approaches participants would take when engaging in their rehabilitation. One item, however, did not reflect these approaches effectively. The “You miss 100% of the shots you don’t take” item did not load onto either factor despite significantly correlating with all but one other item. Due to the otherwise

clear pattern, the complicated way in which this one item behaved, and the potentially confusing way in which the item was phrased (particularly if the participant's first language is not English or if they are unfamiliar with the meaning behind this adage), the item was dropped from further use in Study 2.

Further, the correlational analyses conducted for this study revealed theoretical consistency among variables assessed thus far. Specifically, the proposed recovery strategies that were created to reflect preferences in line with a person's regulatory focus aligned with the other measures. A preference for prevention-focused strategies was related to positive perceptions of the recommended treatment plan, lower likelihood of over adherence (both in terms of ignoring recommendations and trying to expedite recovery), lower risk tolerance, and a longer timeline to return to sport. Meanwhile, a preference for promotion-focused strategies was related to a greater intention to attempt to expedite recovery, a higher degree of risk tolerance, and a shorter return timeline. Study 2 therefore used these measures again to determine their relationship to self-compassion and compare the results with predictions of the protection and authenticity functional perspectives on self-compassion.

Chapter 4: Study 2

The aim of Study 2 was to explore the relationships among self-compassion, regulatory-focus, and risk-taking, using the instruments evaluated during Study 1. By relating self-compassion to regulatory focus and risk-taking, we can better understand the nature of self-compassion's influence on decision-making and whether it more closely aligns with a desire for self-protection or for authentic self-expression. The results of Study 1 support the notion that these differing perspectives exist, can be differentiated empirically, and relate to risk-taking when it comes to sport-injury rehabilitation. The aim of Study 2 was to see how self-compassion aligns with each pattern of correlations.

A secondary aim of Study 2 was to explore relationships between possible co-variates with risk-taking to better understand whether self-compassion has an additive effect or whether risk-taking decisions are simply a product of these other factors. Included among these possible co-variates were regulatory focus, athletic identity, "Big 5" dimensions of personality, and self-esteem. Each of these dimensions was measured using previously developed and established scales, described later in this chapter.

Finally, the prospect of rehabilitating an injury and deciding when and how to return to sport is one that can cause significant emotional distress, as shown by previous research and supported by Study 1. Self-compassion is well-established as a valuable trait for both experiencing positive emotions and mitigating negative emotions during challenging times. I chose to examine the effect that self-compassion may have on emotional experiences related to this scenario, including positive emotions, negative emotions, and specific experiences of doubt and uncertainty as athletes make an important decision which may have unknown outcomes or consequences.

Participants

Participants in this study were psychology undergraduate students who self-selected as participating in competitive sport. To ensure an independent sample, individuals who had participated in Study 1 were ineligible to participate in Study 2. Participants were recruited through a pool of undergraduate psychology students, with the instruction that participants should have participated in sport in the previous 12 months or have plans to participate in sport in the upcoming 12 months. Participant recruitment resulted in an initial sample of $N = 381$ participants. Data were collected between December 2021 and February 2022. Data exclusion criteria were the same as in Study 1. Data from some participants were excluded due to incomplete or blank surveys ($n = 33$) or a failed engagement check and one of self-reported dishonest responding, no listed sport participation, or an inaccurate description of the hypothetical scenario ($n = 17$). To reduce the risk of inattention during survey completion, there was one instructional response item (Meade & Craig, 2012) included in each of two questionnaires. This process has been shown to enhance the validity of online research without substantively affecting analyses (Gummer et al., 2018). Participants who failed both attention checks ($n = 19$) were excluded. Meta-data related to time to complete the questionnaires were used to identify $n = 5$ outliers whose time to complete the questionnaire was more than 2.5 standard deviations above the mean, which were also removed[7]. After these exclusions, the final sample for this study was $N = 307$ participants.

Using G*Power 3.1 (Faul et al., 2007), a sample of $N = 307$ participants is sufficient to detect a small effect of $f^2 = .03$ for a simple linear regression analysis with 80% power. This

[7] Once participants were excluded for other reasons as appropriate, the shortest time to complete the survey was well within one standard deviation of the mean, so no participants were excluded solely based on completing the questionnaire "too quickly"

corresponds to an $R^2 = .03$. For a multiple linear regression analysis with $k = 8$ predictors (the largest model I plan to report), this sample is sufficient to detect a small effect of $f^2 = .05$, $R^2 = .05$ (Cohen, 1988). While a sample of this size is sufficient for conducting simple linear regression analyses, it is smaller than needed for testing interaction effects (Blake & Gangestad, 2020).

Participants ranged in age from 17 to 52 years old ($M = 19.8$, $SD = 4.3$) and identified their gender in the following ways and proportions: woman (74.9%), man (23.5%), gender non-conforming (0.3%), female (0.3%), non-binary (0.3%), and transmasc (0.3%). A majority of participants reported participating in competitive sports in the previous 12 months (59.3%) and planning to participate in the following 12 months (63.2%). Participants identified 39 different primary sports with $n = 146$ participants (47.6%) engaging in at least two sports and reported 0-20 years of prior experience ($M = 5.69$, $SD = 4.44$) and 0-30 hours of current weekly training ($M = 4.59$, $SD = 4.73$) in their primary sport.

Materials

Self-Compassion

Self-compassion was assessed using the 26-item SCS (Neff, 2003b; see Appendix G). The structure of the SCS has been discussed at length above. The SCS is scored using a five-point Likert-type scale, with respondents answering each question on a scale from one (Almost never) to five (Almost always). Sample items include “I try to be loving towards myself when I’m feeling emotional pain,” and “When something painful happens I try to take a balanced view of the situation.” The items are oriented to how participants usually treat themselves when dealing with difficult circumstances. Neff (2003b) recommends computing a total self-compassion score by reverse scoring the negative subscale items (i.e., those related to self-

judgment, isolation, and overidentification), computing subscale means, and ten calculating a grand mean for all six subscale means. In the present study the overall SCS displayed good internal consistency ($\alpha = 0.91$) as did the six subscales ($\alpha = .72$-$.83$), consistent with previous research. Participants in this study reported a moderate level of self-compassion ($M = 2.97$, $SD = 0.61$). The data were normally distributed, Skewness = 0.18, with a range covering most of the scale, [1.30, 4.83]. Although self-compassion tends to increase with age (Homan, 2016; Neff & Vonk, 2009; Potter et al., 2014; Przezdziecki, 2013), in this sample self-compassion was not significantly associated with age ($r = .09$, $p > .05$).

Regulatory Focus and Recovery Strategy Preference

The Regulatory Focus Questionnaire (Higgins, Friedman, Harlow, Chen Idson, et al., 2001; see Appendix H) consists of five items reflecting a prevention focus and six items reflecting a promotion focus. These items reflect the participants' own experiences and attitudes toward situations in their life. Items are scored on a 1 (either "Never or seldom" or "Certainly false") to 5 (either "Very often" or "Certainly true") Likert type scale. The scale produces up to three scores – one for each of promotion and prevention focus strength, and an overall regulatory focus strength that is calculated by subtracting one from the other. In this sample, the promotion focus items displayed low internal consistency ($\alpha = 0.59$) while the prevention focus items had acceptable internal consistency ($\alpha = 0.77$).

Preference for rehabilitation strategies consistent with either a prevention- or promotion-focus was assessed using the instruments developed and refined in Study 1, with the one item dropped as mentioned earlier (see Appendix I). There were six items that reflected prevention-focused recovery strategies and three items that reflected promotion-focused recovery strategies.

The six prevention-focused strategy items displayed good internal consistency ($\alpha = 0.77$), while the consistency of the three promotion-focused strategy items was questionable ($\alpha = 0.64$).

Perceptions of the Recommended Treatment Plan

Participants were once again asked to rate their perceptions of the recommended treatment plan outlined in the hypothetical injury scenario. The items related to treatment-adherence attitudes, norms, and intentions displayed lower internal consistency in this study than in Study 1 ($\alpha = 0.68$). Participants once again reported overall positive perceptions of the treatment plan ($M = 5.16$, $SD = .81$). Participants reported positive attitudes toward the plan ($M = 5.21$, $SD = .89$), perceptions that the treatment plan is in line with social norms ($M = 5.61$, $SD = 1.20$), perceived control over their behaviours ($M = 5.40$, $SD = 1.25$), and a positive intention to engage in the treatment plan ($M = 4.46$, $SD = 1.04$). When asked if the recommended plan was too cautious or too aggressive, 65.8% of respondents described the plan as "about right" ($M = 3.94$, $SD = .88$).

Risk-Taking

The measures of risk-taking used in Study 2 were the same as those used in Study 1, asking participants to rate how much risk they would be willing to tolerate in making their return-to-play decisions if faced with the hypothetical scenario. These included items identifying the level of probability, consequence, severity, and predictability of re-injury that would be tolerated, as well as how long the individual would wait before returning to their sport. Based on the results of Study 1, the four items describing probability, consequence, severity, and predictability were averaged to create an aggregated risk-taking score ($\alpha = 0.55$), with the time to return treated separately. Means and standard deviations of each aspect of risk-taking, as well as

Table 6

Descriptive Statistics of Aspects of Risk-Taking

Aspect of Risk-Taking	*n*	*M*	SD	Minimum	Maximum	Skewness	Kurtosis
Probability of Re-Injury	307	36.84	23.64	0.00	100.00	.77	-.26
Consequences of Re-Injury	306	29.42	19.36	0.00	100.00	.90	.70
Severity of Re-Injury	305	24.67	20.77	0.00	96.00	.88	.21
Predictability of Re-Injury	305	42.94	26.39	0.00	100.00	.34	-.82
Aggregated Risk-Taking	307	33.60	15.26	0.00	100.00	.22	.32
Time to Return	307	8.67	1.59	6.00	12.00	.15	-.47

the overall scores, are in Table 6. The skewness and kurtosis statistics were all within the acceptable range, suggesting that the variables were normally distributed.

Positive and Negative Affect

The emotional experiences and consequences of the hypothetical injury scenario will highlight how self-compassion may buffer the impact of negative emotions. Emotional experiences, including positive and negative affect, were assessed using the Positive and Negative Affect Schedule – Expanded Form (Watson & Clark, 1994). Added to this were four items related to uncertainty, a construct relevant to this study but not typically included in the PANAS-X; “torn”, “uncertain”, “ambivalent”, and “conflicted” (Appendix J). Participants were asked to complete these items as if they had experienced the hypothetical injury scenario and in response to making important decisions about their care and recovery.

The PANAS-X produces scales for several categories of emotions – the general dimensions of positive and negative affect, the basic negative emotions of fear, hostility, guilt, and sadness, the basic positive emotions of joviality, self-assurance, and attentiveness, and other scales of shyness, fatigue, serenity, surprise, and, in the case of this research, uncertainty. Reliability statistics for each of these scales ranged from $\alpha = 0.63 – 0.94$. Predictably, the lowest reliability ratings were for the scales with the fewest items. Scales comprised of at least four items all had reliability statistics of $\alpha = 0.69$ or greater. For the sake of clarity and brevity, the full descriptive statistics for the PANAS-X can be found in Table 7.

Sport Passion and Athletic Identity

Testing the authenticity interpretation of self-compassion requires a measure of athletic identity to be included in the study design. The 22-item AIMS-Plus (Cieslak, 2004; Appendix K) is scored on an 11-point Likert-type scale from 0 ("Strongly Disagree") to 100 ("Strongly Agree"), with items averaged to create both an overall Athletic Identity scale score, as well as five subscale scores. These items ask participants to describe their athletic identity in an overall sense, not just in response to the injury scenario. In previous research the AIMS-Plus has displayed strong internal consistency with an overall $\alpha = 0.96$, with subscale reliability ranging from $\alpha = 0.70$ (Social Identity subscale) to $\alpha = 0.89$ (Positive Affectivity subscale; Cieslak, 2004). Confirmatory factor analysis loadings show acceptable to strong construct validity for the items that make up each of the subscales: Social Identity (0.27-0.84)[8]; Exclusivity (0.64-0.79); Self-Identity (0.65-0.83); Positive Affectivity (0.74-0.86); and Negative Affectivity (0.62-0.82; Cieslak, 2004). Similar results were shown during the adaptation of the scale for a non-English-

[8] The most notable exception to this analysis was item 3 ("Most of my friends participate in sport") from the Social Identity subscale. Removing this item would raise the lowest factor loading to 0.44 (Cieslak, 2004).

Table 7

Descriptive Statistics – Emotional Experiences

PANAS-X Scale	*n*	*M*	*SD*	Minimum	Maximum	Skewness	Kurtosis
Positive Affect	307	2.53	.81	1.00	5.00	.42	-.16
Negative Affect	307	2.49	.82	1.00	4.70	.43	-.38
Uncertainty	307	2.57	.85	1.00	5.00	.27	-.44
Fear	307	2.48	.90	1.00	5.00	.42	-.43
Hostility	307	2.33	.82	1.00	4.83	.40	-.31
Guilt	307	2.27	.98	1.00	5.00	.65	-.39
Sadness	307	2.60	.95	1.00	5.00	.38	-.61
Joviality	307	1.96	.94	1.00	5.00	1.01	.20
Self-Assurance	307	2.33	.84	1.00	4.83	.43	-.39
Attentiveness	307	3.01	.90	1.00	5.00	.00	-.54
Shyness	307	2.04	.74	1.00	4.50	.48	-.27
Fatigue	307	2.61	.90	1.00	5.00	.18	-.77
Serenity	307	2.31	.87	1.00	5.00	.52	-.16
Surprise	307	2.18	.80	1.00	5.00	.46	-.23

speaking population (Cabrita et al., 2014).

Due to an error during data collection, the AIMS-Plus contained more missing data than expected. The 22-items are measured on a 0-100 scale and were presented to participants using a "slider" style. However, the default position of the slider was set to zero, perhaps suggesting to participants that they did not need to interact with the item if their response for a particular item was, in fact, zero. If participants did not interact with the item at all, the data returned a value of "missing" rather than a value of zero. Because I could not be confident whether missing values

were intended to represent a response of zero or whether they were truly missing (e.g., participants chose to skip the item or failed to respond), the issue of how to deal with these missing values became relevant.

Missing data are a common feature of scientific research, and as such much attention has been dedicated to the topic. van Buuren (2021) provides an account of the many challenges caused by missing data, the fields in which the issue has been studied, and several of the most used approaches to dealing with missingness. Among these include listwise deletion, pairwise deletion, mean imputation, regression imputation, and others. Each approach, however, has drawbacks that can lead to biased or distorted estimates, especially if data are not missing at random (NMAR). Data are said to be NMAR when the probability of being missing varies in ways that are unknown or in a systematic way. In this case, because data were theoretically more likely to be missing if participants chose to respond "0" to a particular item, they were determined to be NMAR. In this sample, I chose to exclude cases using listwise deletion, where a case is removed if it contains any missing data among the variables to be analyzed. In reporting analyses that involved the AIMS-Plus, I have also included the relevant sample size after cases were deleted.

In the present sample, the AIMS-Plus displayed excellent internal consistency overall (n = 278, α = 0.96. The reliability statistics for the different subscales were as follows: Social Identity (n = 281, α = 0.77); Exclusivity (n = 283, α = 0.87), Self-Identity (n = 284, α = 0.87), Positive Affectivity (n = 298, α = 0.93), Negative Affectivity (n = 292, α = 0.86). Descriptive statistics for each of the AIMS-Plus subscales are in Table 8.

Table 8

Descriptive Statistics – AIMS-Plus Subscales

AIMS-Plus Subscale	*N*	*M*	*SD*	Minimum	Maximum	Skewness	Kurtosis
Overall	307	46.65	21.32	0.00	94.09	-.35	-.62
Social Identity	305	36.22	21.10	0.00	96.00	.19	-.81
Exclusivity	302	32.79	23.26	0.00	90.00	.33	-.92
Self-Identity	307	41.78	25.46	0.00	97.50	.01	-1.09
Negative Affectivity	303	58.34	26.20	0.00	100.00	-.62	-.44
Positive Affectivity	304	70.16	27.35	0.00	100.00	-1.09	.33

The same 4-item Passion scale that was used in Study 1 was also used to provide convergent validity for the AIMS-Plus. The passion scale ($M = 5.11$, $SD = 1.54$) was strongly positively correlated with athletic identity, including the overall score, $r = .70$, $p < .001$. The passion score was also strongly positively correlated with each of the athletic identity subscales, $r = .56$-$.70$, $p < .001$. These data suggest that participants who care deeply about their sport and are passionate about their participation are also those who have a strong athletic identity, which logically follows, and that the AIMS-Plus was effective in capturing this idea.

Personality

Given some theoretical overlap among self-compassion, risk-taking, and dimensions of personality, it was important to assess the impact of different personality traits that persist across contexts. The Ten-Item Personality Inventory (Gosling et al., 2003; Appendix L) is a valid, reliable, and brief measure of the "Big 5" personality traits (Goldberg, 1990), making it more suitable for this research context than more comprehensive versions (P. T. Costa & McCrae,

1985, 1992). As described earlier, some facets of self-compassion may be closely related to openness to experience and neuroticism, while risk-taking shares some features of openness and extraversion. The TIPI was used to elucidate these relationships.

The TIPI is scored on a 7-point Likert type scale. Mean scores on each dimension among participants in this study were as follows: Extraversion (M = 4.07, SD = 1.51); Agreeableness (M = 4.86, SD = 1.10); Conscientiousness (M = 5.28, SD = 1.19); Emotional Stability (M = 4.37, SD = 1.46); Openness to Experience (M = 5.28, SD = 1.12).

Self-Esteem

Although self-esteem and self-compassion are distinct constructs that should not be conflated (Neff, 2011), there is a reasonable degree of overlap between the two – both represent sources of positive self-regard that reflect a felt sense of value and appreciation. Self-esteem has been the subject of extensive research (Baumeister, 1998) utilizing different methodological approaches. An important and valuable development in self-esteem research was the creation of the Single-Item Self-Esteem Scale (Robins et al., 2001; Appendix M), a reliable and valid measure of global self-esteem and which I chose to use in this study. The item is scored on a scale from 1-5. In the present sample, participants reported a moderate level of self-esteem (M = 3.17, SD = 1.14).

Procedure

Study 2 study was again conducted online using Qualtrics in a procedure like Study 1. This procedure was approved from an internal Research Ethics Board (REB).

Overview of Analysis Plan

The objective of this stage of analysis was to determine whether the relationships between self-compassion and each of the primary dependent variables that reflect behavioural decision-

making in a sport injury rehabilitation context (i.e., risk-taking, preference for certain recovery strategies, and rehabilitation overadherence) more consistently resembles a prevention focus, a promotion focus, or athletic identity. The plan to achieve this goal was to test linear regression models of each of the dependent variables with self-compassion and either the regulatory focus or athletic identity measures as predictors. The decision not to include the regulatory focus and athletic identity measures in the same model was based on the missing data in the athletic identity measures and the impact they would have on analyses of regulatory focus. By also testing these models in relation to coping and emotional responses to the scenario, including positive and negative affect, and feelings of uncertainty, I could establish whether self-compassion, regulatory focus, and athletic identity have similar effects in the sports-injury context as they have been shown to have in other contexts. The focus of the present analyses was on the resemblance of effect patterns between self-compassion and either prevention focus or promotion focus/athletic identity, with respect to the decision-making, rehabilitation strategy, and emotion dependent measures.

Results

Preliminary Analyses

Preliminary analyses were undertaken to re-confirm the measurement properties of the rehabilitation overadherence, recovery-strategy preference, and risk-taking scales. Study 1 indicated that the measures were appropriate for use. In Study 2, the measures functioned similarly appropriately, though with slight differences. In Study 2, using principal axis factoring with varimax rotation to replicate the original ROAQ scale development, the ten items fully replicated the originally established factor structure by reducing to only two factors (Ignoring

Table 9

Factor Structure of the Rehabilitation Overadherence Questionnaire (ROAQ)

ROAQ Item	Factor loading	
	1	2
Factor 1: Ignoring		
1. How frequently would you ignore your physician's advice to avoid pushing through unwanted pain?	**.64**	.28
2. How frequently would you ignore your physician's recommendations to avoid specific exercises or activities?	**.61**	.29
3. How frequently would you avoid reporting pain to your physician?	**.70**	.13
4. How frequently would you hide pain about your injury from doctors or other rehabilitation experts?	**.74**	.11
5. How frequently would you ignore your physician's recommendations to avoid "doing too much too soon" in your rehabilitation?	**.66**	.27
8. In thinking about my rehabilitation, I think that my family or teammates would be concerned if I ignore my physician's advice to limit the rehabilitation exercises I perform	.26	-.12
Factor 2: Expediting Recovery		
6. How frequently would you try to catch up with other athletes who are further ahead in their rehabilitation?	.36	**.48**
7. How frequently would you perform more rehabilitation exercises than your physician recommends?	.23	**.53**
9. In thinking about my rehabilitation, I think it is usually better to do too much rehabilitation than not enough	-.05	**.57**
10. In thinking about my rehabilitation, I believe I must progress as quickly as possible in order to avoid losing physical fitness	.12	**.67**

Note. N = 307. The extraction method was principal axis factoring with an orthogonal (Varimax with Kaiser Normalization) rotation. Factor loadings above .40 are in bold

and Expediting; Table 9). These two factors accounted for 25.2% and 15.4% of the variance, respectively. One item ("In thinking about my rehabilitation I think that my family or teammates would be concerned if I ignore my physician's advice to limit the rehabilitation exercises I perform.") did not load onto either factor, just as in Study 1. This two-factor structure was chosen for use in Study 2.

Both subscales of the ROAQ displayed acceptable internal consistency (Table 10). The mean of the "Ignoring" subscale was lower than that of the "Expediting" subscale, suggesting that most participants are not going against their doctor's recommendations, but further examination of the skewness and kurtosis statistics showed that the data were still normally distributed.

The anticipated factor structure of the items assessing preference for recovery strategies reflective of regulatory focus functioned exactly as predicted, similarly to how it behaved in Study 1 (see Table 11). The six items that were created to reflect preference for prevention-focused strategies all loaded onto the same factor, which accounted for 28.1% of the variance. The three items that were kept reflecting preference for promotion-focused strategies all loaded onto the other factor, accounting for an additional 14.1% of the variance. There were no cross-loading items in this sample.

Table 10

Descriptive Statistics – ROAQ

ROAQ Subscale	*M*	*SD*	α	Skewness	Kurtosis
Ignore Practitioner Recommendations	1.71	.67	.79	.94	.21
Expedite Recovery	2.95	.87	.67	-.01	-.44

Table 11

Factor Structure of Recovery Strategy Preferences

Recovery Strategy Preferences Item	Factor loading	
	1	2
Factor 1: Prevention Focus		
3. My main focus would be my health and functioning of my knee	**.52**	.03
5. I would adhere to my doctor's recommendation of time away from participating in my sport, regardless of how I was feeling	**.53**	-.19
6. I would wait as long as necessary to feel 100% recovered before undertaking any sport-related activities	**.63**	-.15
10. I would closely monitor my pain and symptoms in the hope of not making my situation worse through my activities	**.57**	.25
11. I would seek to avoid re-injury at all costs	**.72**	-.00
12. My motto during this time would be, "Better safe than sorry."	**.85**	-.15
Factor 2: Promotion Focus		
4. My main focus would be recovering my health and getting back to sport participation as quickly and fully as possible	-.03	**.50**
10. I would look for every opportunity to hasten my recovery and return to participating in my sport as quickly as possible	-.15	**.70**
11. I would seek out additional treatments and exercises (e.g., cryotherapy, yoga) to recover more quickly	.05	**.62**

Note. N = 307. The extraction method was principal axis factoring with an orthogonal (Varimax with Kaiser Normalization) rotation. Factor loadings above .40 are in bold.

Table 12

Descriptive Statistics – Recovery Strategy Preferences

Recovery Strategy Preference	*M*	*SD*	α	Skewness	Kurtosis
Prevention-Focused Strategies	4.34	.65	.80	-1.27	1.62
Promotion-Focused Strategies	3.75	.88	.64	-.44	-.49

The description of prevention-focused recovery strategies displayed higher internal consistency than the description of promotion-focused recovery strategies (Table 12). This may be related to the smaller number of promotion-focused recovery items, though all three items were positively and significantly correlated with each other (r = 0.29-0.42, $p < .001$).

Finally, in Study 1 the four items assessing dimensions of risk-taking were combined to form an aggregate risk-taking score, while the item measuring time to return was kept separate. Once again, the item measuring time to return was reverse scored so higher values represent a shorter timeline and greater risk tolerance, to remain consistent with the other risk-taking items. In Study 2, the three items capturing probability, consequence, and severity of re-injury all loaded onto the first factor, with predictability falling just below the > .40 threshold (Table 13). This first factor accounted for 23.3% of the variance. The time to return item loaded onto a second factor, accounting for an additional 7.4% of the variance. Given the similarity in how the items were organized in each of the two studies, I chose to score and report them similarly, with the four dimensions of risk-taking as a single aggregated construct and time to return presented as its own separate measure of risk. For supplementary analyses, including preliminary explorations of interaction effects, utilizing the AIMS-Plus subscales, and treating each dimension of risk-taking separately see Appendix N and Appendix O.

Table 13

Factor Structure of Aspects of Risk-Taking

Aspects of Risk-Taking	Factor loading	
	1	2
Factor 1: Risk-Taking		
1. At what level of probability would you decide to return to participating in your sport? In other words, if the doctor you're your probability of re-injury was less than __%, you would decide to resume participating now.	**.40**	-.07
2. At what level of consequences would you decide to return to participating in your sport? In other words, if the doctor said that re-injury would set you back by __% of the progress you had made in the last 6 months, you would decide to resume participating now.	**.70**	.04
3. At what level of severity of re-injury would you decide to return to participating in your sport? In other words, if the doctor said that re-injury would cost you __% of your ability to participate (i.e., 0% means you would return to your normal participation eventually, 100% means you would never be able to participate in the same way again), you would decide to resume participating now.	**.62**	.10
4. Some injuries can be the result of gradual wear-and-tear that is a predictable part of participating in sport, while others are more often the result of collisions, accidents, or other unpredictable events. At what level of predictability would you decide to return to participating in your sport? In other words, if the doctor said the predictability of re-injury was than __% (i.e., 0% means completely unpredictable and 100% means completely predictable), you would decide to resume participating now.	.33	-.41
Factor 2: Time to Return		
5. Given the above description of both typical recovery from ACL surgery and your personal recovery to date, at what point in time between 6 months and 12 months would you expect to return to participating in your sport?	.12	**.43**

Note. N = 307. The extraction method was principal axis factoring with an orthogonal (Varimax with Kaiser Normalization) rotation. Factor loadings above .40 are in bold.

Risk-Taking and Rehabilitation Decisions

The purpose of this section is to examine the relationships among self-compassion, regulatory focus, risk-taking, and rehabilitation overadherence in response to a hypothetical injury scenario. Table 14 displays the means, standard deviations, reliability statistics, and inter-correlations of these variables, as well as potentially influential co-variates such as athletic identity, self-esteem, and dimensions of personality.

There were several notable relationships to highlight from these analyses. First, aggregated risk-taking was not significantly correlated with any of the independent variables of interest in this study. Among the primary independent variables of self-compassion, regulatory focus, and athletic identity, time to return was only correlated with promotion focus and to a small degree. Overall, it appears that there were very few factors that influenced risk-taking in this scenario.

Exploring preferences for rehabilitation strategies revealed more effects. Self-compassion was correlated with a preference for prevention-focused revery strategies and negatively correlated with ignoring, suggesting that those higher in self-compassion were expressing a preference for a recovery approach that prioritizes protection and safety through careful monitoring of progress and adhering to their doctor's recommendations rather than crafting their rehab program independently of expert advice. Prevention focus also perfectly replicated the pattern of self-compassion, providing evidence for the self-protection perspective of self-compassion. This supports the argument for the self-protection perspective of self-compassion. Whether these relationships are distinct and additive, or whether they overlap, will be examined in later analyses.

Table 14

Descriptive Statistics and Correlations – Risk and Recovery Measures

Variable	*M*	*SD*	α	Aggregated Risk-Taking	Time to Return	Prevention-Focused Strategies	Promotion-Focused Strategies	Ignoring	Expediting
Self-Compassion	2.97	0.61	.89	.06	.04	.21**	.10	-.20**	-.06
Prevention Focus	3.39	0.84	.77	-.05	.03	.14*	-.03	-.25**	-.05
Promotion Focus	3.45	0.57	.56	-.04	.12*	-.02	.18**	-.06	.05
Athletic Identity	47.18	21.60	.96	.06	.10	-.16**	.19**	.08	.14*
(*n* = 278)									
Self-Esteem	3.17	1.14	-	.01	.08	-.01	.11	-.05	.03
Openness	5.28	1.12	.43	.08	.16**	-.05	.08	.05	.10
Conscientiousness	5.28	1.19	.41	.02	.05	.17**	.07	-.22**	-.02
Extraversion	4.07	1.51	.66	.07	.16**	-.20**	.06	.09	.10
Agreeableness	4.86	1.10	.29	-.08	-.01	.14*	-.11	-.15**	-.17**
Emotional Stability	4.37	1.46	.61	.02	.04	.09	.02	-.14*	-.02
M (*SD*)				33.60	8.67	4.34	3.75	1.71	2.95
SD				15.26	1.59	0.64	0.88	0.67	0.87
α				.55	-	.80	.64	.79	.67

Note: *$p < .05$, **$p < .01$

Second, both prevention and promotion focus were positively correlated with a preference for the corresponding type of strategy and not with the other, lending support to the discriminant validity of both the newly created measures and of the constructs. The items created for this study effectively distinguish between preference for different strategies, and one must assess both prevention and promotion focus independently to predict how an individual may approach their rehabilitation decisions.

Athletic identity was also associated with preference for different recovery strategies in the anticipated ways. This included a preference for promotion-focused recovery strategies and attempts to expedite recovery, and a negative correlation with prevention-focused recovery. These findings presented a distinct set of correlations with athletic identity than with self-compassion. Whether these relationships persist when accounting for regulatory focus and dimensions of personality will be explored later to better understand the unique role of each construct.

Regression Analyses. Hierarchical linear regressions were used to evaluate the relationships among self-compassion, regulatory focus, and athletic identity as predictors of risk-taking and recovery strategy preference. The first block of analysis included the predictors of theoretical interest, with a second block containing potentially confounding personality variables, selected based on their zero-order correlations with the corresponding dependent measure.

Risk-Taking. The first research question to be addressed was whether self-compassion and regulatory focus affect risk-taking. There were very few effects in this part of the analysis. There were no significant relationships between self-compassion, either type of regulatory focus, and either aggregated risk-taking or time to return. The simple correlation between promotion focus and time to return was no longer significant when accounting for self-compassion and

Table 15

Dimensions of Risk-Taking Based on Self-Compassion, Regulatory Focus, and Personality

	Risk-Taking					
	Aggregated Risk-Tolerance			Time to Return		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.010		.364	.014		.230
Self-Compassion		.09	.138		-.00	.961
Promotion Focus		-.06	.330		.12	.057
Prevention Focus		-.05	.400		.00	.976

prevention focus. This analysis suggests that self-compassion does not seem to influence the aggregate amount of risk an athlete would take in making their return to play nor the point in their recovery timeline when they would make this decision. There was no evidence to suggest that regulatory focus affects any aspect of risk-taking in this scenario either (see Table 15).

Rehabilitation Decisions. The next set of analyses were oriented toward understanding how self-compassion and regulatory focus impact behavioural rehabilitation decisions when it comes to preferred recovery strategies and adherence to practitioner recommendations. Once again, the first model included only the simple effects of self-compassion, prevention focus, and promotion focus, while the second model also included the relevant covariates. These models are displayed in full in Table 16.

In examining preference for prevention-focused recovery strategies (i.e., prioritizing health and functioning, avoiding over-activity), the first model predicted a significant amount of the variance in preference for these strategies, $F(3,303) = 7.88$, $R^2 = .072$. Self-compassion and strength of prevention-focus were both positively associated with preference for prevention-focused strategies. Strength of promotion focus was negatively associated with preference for

Table 16

Preference for Certain Recovery Strategies Based on Self-Compassion and Regulatory Focus

	Recovery Strategies											
	Prevention-Focused			Promotion-Focused			Ignoring			Expediting		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.072		< .001	.042		.005	.091		< .001	.011		.322
Self-Compassion		.24	< .001		.05	.442		-.19	.002		-.08	.186
Prevention Focus		.14	.017		-.09	.145		-.23	< .001		-.06	.349
Promotion Focus		-.14	.021		.19	.003		.07	.272		.09	.159
Model 2	.074		< .001				.022		.059			
Self-Compassion		.25	< .001					-.17	.016			
Prevention Focus		.03	.596					-.17	.005			
Promotion Focus		-.10	.121					.09	.136			
Conscientiousness		.15	.012					-.14	.020			
Extraversion		-.24	< .001									
Agreeableness		.09	.103					-.08	.144			
Emotional Stability								.02	.792			

these strategies. The second model, which included the co-variates of conscientiousness, extraversion, and agreeableness, was also significant and explained additional variance, $F(6,300) = 8.57$, $R^2 = .146$. Self-compassion continued to significantly predict preference for these strategies but the relationship between prevention focus and preference for strategies disappeared. Instead, extraversion was negatively associated with prevention-focused strategy preference, while there was a positive relationship between conscientiousness and recovery strategy preference. The relationship between prevention-focused strategies and agreeableness was non-significant. There are two significant takeaways from these data: 1) higher self-compassion was associated with stronger preference for prevention-focused rehabilitation strategies, even when chronic prevention focus was controlled, and 2) whereas the role of chronic prevention focus could be accounted for by other personality variables, this was not the case for self-compassion.

The second set of regression models examined preferences for promotion-focused recovery strategies (i.e., prioritizing an expedited return-to-play, seeking out additional treatment). The first model significantly predicted preference for these strategies, $F(3,303) = 4.43$, $R^2 = .042$. Only strength of promotion focus was significantly associated with preference for promotion-focused recovery strategies. Only one model was tested in this case as there were no dimensions of personality or self-esteem that were significantly correlated with the dependent variable.

The third set of regression models examined the relationships among self-compassion and regulatory focus as predictors of ignoring treatment recommendations, one form of rehabilitation overadherence. The first model significantly predicted ignoring, $F(3,303) = 10.05$, $R^2 = .091$. Both self-compassion and prevention-focus were negatively associated with ignoring.

There was no relationship between promotion focus and ignoring. The second model, which included conscientiousness, agreeableness, and emotional stability, also predicted ignoring, $F(6,300) = 6.36$, $R^2 = .113$. The degree of additional variance predicted was below the threshold for significance. Once again, the notable results were that self-compassion predicted a lower likelihood of deviating from the recommended treatment plan, beyond the possible influence of chronic prevention focus, and this relationship with self-compassion persisted even when accounting for self-esteem and personality covariates.

The final regression model examined attempts to expedite recovery. This model revealed no statistically significant effects of self-compassion or either type of regulatory focus, $F(3,303) = 1.17$, $R^2 = .011$.[9]

As expected, individuals with a stronger regulatory focus of one type were more likely to express a preference for the recovery strategies associated with that type. With respect to prevention-focused strategies, this preference seems to reflect higher conscientiousness and lower extraversion more than strength of regulatory focus. It should also be noted that there was minimal evidence to suggest a strong regulatory focus of one type is related to an individual's tendency to engage in strategies of the opposite type. That is, just because a person may have a strong prevention focus does not mean they are any more or less likely to seek out additional treatment strategies, for example. In my data, there was no relationship between prevention focus strength and preference for promotion-focused strategies, and the relationship between promotion focus and prevention-focused strategy preference was entirely accounted for by personality variables.

Notably, and to be discussed at greater length in the following chapter, self-compassion

[9] A model which included co-variates was significant, $F(4,302) = 2.66$, $R^2 = .034$, $\Delta R^2 = .023$, $p = .033$. In this model, agreeableness was negatively associated with expediting, $\beta = -.16$, $p = .008$.

did so in an additive way with prevention-focus itself. This may suggest that self-compassion is reflective of a greater tendency toward self-protection and self-care that also has an independent source from chronic prevention-focus.

When it comes to rehabilitation overadherence, both self-compassion and prevention-focus were associated with a decrease in ignoring practitioner recommendations. This is reflective of the self-care perspective of self-compassion. Overadherence was also significantly negatively associated with conscientiousness which is logically consistent. An athlete who pays attention to detail and does what is asked of them is unlikely to ignore the recommendations of a medical professional. Meanwhile, a desire to expedite recovery seems to reflect a willingness to try new experiences.

Emotional Experience and Coping. Previous research has consistently shown that self-compassion is associated with increased experiences of positive emotion and decreased experiences of negative emotion during difficult situations (Leary et al., 2007; Mantelou & Karakasidou, 2017; Neff, Rude, et al., 2007). Research using the PANAS, specifically, showed that self-compassion had a positive correlation with positive affect, and a negative correlation with negative affect (Smeets et al., 2014). The context of this research also makes feelings of uncertainty relevant, along with positive and negative emotions. Table 17 displays the means, standard deviations, reliability statistics, and inter-correlations among self-compassion, regulatory focus, athletic identity, self-esteem, and personality dimensions, and emotional experiences and coping in response to the scenario.

As in the analyses of risk-taking and rehabilitation approach, each case included only self-compassion and regulatory focus in the first regression model before adding relevant co-variates to the second model (see Table 18). The first relationships measured included

Table 17

Descriptive Statistics and Correlations – Emotional Experience and Coping

	Positive Affect	Negative Affect	Uncertainty
Self-compassion	.24***	-.30**	-.26***
Prevention Focus	.09	-.01	.03
Promotion Focus	.12*	-.07	-.03
Athletic Identity (n = 278)	.16**	.17*	.18**
Self-Esteem	.30***	-.15*	-.12
Openness	.19**	.05	.04
Conscientiousness	.14*	-.04	-.05
Extraversion	.06	.03	-.01
Agreeableness	.08	-.01	-.03
Emotional Stability	.23***	-.25***	-.19**
M	2.53	2.49	2.57
SD	.81	.82	.85
α	.87	.89	.73

Note: *$p < .05$, **$p < .01$, ***$p < .001$

Table 18

Emotional Responses Based on Self-Compassion and Regulatory Focus

	Emotions								
	Positive Affect			Negative Affect			Uncertainty		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.058		< .001	.092		< .001	.073		< .001
Self-Compassion		.22	< .001		-.32	< .001		-.29	< .001
Prevention Focus		.04	.454		.03	.548		.06	.280
Promotion Focus		.03	.666		.04	.537		.06	.337
Model 2	.074		< .001	.011		.155	.003		.312
Self-Compassion		.07	.334		-.25	< .001		-.25	< .001
Prevention Focus		.04	.477		.04	.484		.06	.262
Promotion Focus		-.09	.165		.04	.523		.06	.306
Emotional Stability		.07	.348		-.14	.055		-.07	.312
Openness to Experience		.13	.023						
Conscientiousness		.09	.162						
Self-Esteem		.23	< .001		.02	.793			

self-compassion, regulatory focus, and covariates as predictors of positive affect. The first model was statistically significant, $F(3,303) = 6.22$, $R^2 = .058$. In this model, self-compassion was significantly related to increased positive affect. In the second model, which included emotional stability, openness to experience, conscientiousness, and self-esteem as co-variates, only self-esteem and openness to experience were significantly associated with positive affect, though the model as a whole accounted for significantly greater variance, $F(7,299) = 6.49$, $R^2 = .132$.

In testing the effects of self-compassion and regulatory focus on negative affect, the first model was statistically significant, $F(3,303) = 10.28$, $R^2 = .092$. Only self-compassion was negatively associated with negative affect.

Finally, the first model predicting feelings of uncertainty was significant, $F(3,303) = 7.96$, $R^2 = .073$. Only self-compassion was significantly related to decreased feelings of uncertainty.

Overall, self-compassion was associated with increased positive affect, though this seemed to primarily be driven by self-esteem and openness to experience. When these predictors were added to the model, they predicted positive affect more strongly than self-compassion, and the effect of self-compassion went away. Self-compassion was, however, associated with decreased negative affect, and decreased uncertainty, consistent with the hypothesized relationships and previous research, and neither of these effects could be explained by emotional stability or self-esteem. Self-compassion remained a stronger and significant predictor of reduced negative affect and uncertainty in response to the injury and rehabilitation scenario. There was no evidence to suggest that regulatory focus affects emotional experience in this scenario.

The Impact of Athletic Identity

The aim of this research is to examine whether protection or authenticity better describes self-compassion's functioning in sports injury rehabilitation decisions. So far, the evidence suggests that self-compassion promotes protection as it does not increase the amount of risk a person is willing to tolerate but does encourage a prevention-focused approach to rehabilitation and mitigate distressing emotions. In the next section, I explored athletic identity as a comparison for the authenticity interpretation.

Regression Analyses. Multiple linear regression models were constructed in a similar way to the previous analyses, with self-compassion and athletic identity examined in the first model and relevant co-variates added in the second.

Risk-Taking. Regression models estimating the effects of self-compassion, athletic identity, and personality on aspects of risk-taking were mostly non-significant. Only extraversion was significantly associated with time to return. As with the previous analyses, there was no evidence to suggest that either self-compassion or athletic identity significantly impact the amount of risk an athlete is willing to tolerate in making their return-to-play decisions. The full account of the models and accompanying regression coefficients can be found in Table 19.

Recovery Strategies. It is possible that individuals with a stronger athletic identity would display greater preference for promotion-focused recovery strategies and overadherence as they seek to expedite recovery and return to what gives them their sense of identity. The next set of analyses were designed to explore the relationships between self-compassion and athletic identity as predictors of recovery strategy preference (see Table 20).

Table 19

Dimensions of Risk-Taking Based on Self-Compassion and Athletic Identity

	Risk-Taking					
	Aggregated Risk-Tolerance			Time to Return		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.003		.672	.013		.176
Self-Compassion		.03	.672		.01	.821
Athletic Identity		.05	.452		.11	.067
Model 2				.030		.016
Self-Compassion					-.03	.640
Athletic Identity					.07	.242
Openness					.06	.356
Extraversion					.15	.025

Table 20

Preference for Certain recovery Strategies Based on Self-Compassion and Athletic Identity

	Recovery Strategies						Overadherence					
	Prevention-Focused			Promotion-Focused			Ignoring			Expediting		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.077		< .001	.040		.004	.040		.004	.029		.018
Self-Compassion		.23	< .001		.05			-.18	.003		-.10	.101
Athletic Identity		-.17	.003		.19	.002		.10	.091		.15	.015
Model 2	.080		< .001				.044		.005	.021		.014
Self-Compassion		.23	< .001					-.14	.058		-.07	.258
Athletic Identity		-.15	.011					.12	.036		.14	.021
Openness												
Conscientiousness		.16	.005					-.20	< .001			
Extraversion		-.22	< .001									
Agreeableness		.09	.115					-.08	.198		-.15	.014
Emotional Stability								.02	.753			

In examining preference for prevention-focused strategies, the first model accounted for significant variance in strategy preference, $F(2,275) = 11.46$, $R^2 = .077$. There was a positive relationship between self-compassion and preference for prevention-focused strategies while there was a negative relationship between athletic identity and prevention-focused strategy preference. The second model included conscientiousness, extraversion, and agreeableness and significantly accounted for additional variance, $F(5,272) = 10.11$, $R^2 = .157$. In this model, there were positive relationships between prevention-focused strategies and self-compassion and conscientiousness. There were negative relationships with athletic identity and extraversion.

Regarding promotion-focused recovery strategy preference, only self-compassion and athletic identity were correlated with strategy preference, so only one model was tested. This model was significant, $F(2,275) = 5.76$, $R^2 = .040$. Self-compassion was not significantly associated with strategy preference, while athletic identity had a positive association with promotion-focused strategy preference.

In analyzing rehabilitation overadherence, the first model including self-compassion and athletic identity was significantly predictive of ignoring, $F(2,275) = 5.76$, $R^2 = .040$. Only self-compassion was related to ignoring while athletic identity was not. The second model also included conscientiousness, agreeableness, and emotional stability. This model was also significant, $F(5,272) = 5.03$, $R^2 = .085$. In this model, athletic identity was positively associated with ignoring while conscientiousness was negatively associated.

The final set of models was related to attempts to expedite recovery. The first model, which included only self-compassion and athletic identity, was significant, $F(2,275) = 4.09$, $R^2 = .029$. Only athletic identity was significantly associated with expediting. The second model included agreeableness and was also significant, $F(3,274) = 4.82$, $R^2 = .050$. In this model,

athletic identity was positively associated with expediting while agreeableness was negatively associated.

These regression analyses provided further support for the protection perspective of self-compassion. Like self-compassion, athletic identity cannot be reduced to other personality variables, and its association with these variables is consistently in the opposite direction to that of self-compassion. The case of ignoring practitioner recommendations is an interesting one, as a significant relationship with self-compassion disappears when accounting for personality, while a previously non-significant relationship with athletic identity seems to gain significance when these personality factors are considered. This is most likely due to the inclusion of conscientiousness which has the single largest relationship to ignoring of any predictors in the second model.

Emotional Experience. The next analyses explored the relationships between self-compassion and athletic identity as predictors of emotional experiences in response to the scenario, following the same structure as above (Table 21). Beginning with positive affect, the first model included self-compassion and athletic identity. This model explained a significant amount of the variance in positive affect, $F(2,275) = 12.87$, $R^2 = .086$. Both self-compassion and athletic identity were positively associated with positive emotion. The second model included emotional stability, openness to experience, conscientiousness, and self-esteem. This model was significant and accounted for additional variance, $F(6,271) = 7.25$, $R^2 = .138$. Only self-esteem and openness to experience were significantly associated with positive affect.

The second set of analyses explored experiences of negative affect. The first model was significant, $F(2,275) = 17.72$, $R^2 = .114$. Self-compassion was associated with decreased negative affect while athletic identity was associated with increased negative affect. The second

model included emotional stability and self-esteem as co-variates and was also significant, $F(4,273) = 9.91$, $R^2 = .127$. However, this model did not account for significant additional variance beyond the initial model.

The third set of analyses examined feelings of uncertainty. The first model explained a significant amount of the variance in uncertainty, $F(2,275) = 14.35$, $R^2 = .094$. Self-compassion was associated with decreased uncertainty while athletic identity was associated with increased uncertainty. The second model, which included emotional stability, was also significant, $F(3,274) = 9.91$, $R^2 = .098$, but did not account for a greater percentage of the variance than the first model.

Table 21

Emotional Responses Based on Self-Compassion and Athletic Identity

	Emotions								
	Positive Affect			Negative Affect			Uncertainty		
Predictor	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.086		< .001	.114		< .001	.094		< .001
Self-Compassion		.25	< .001		-.30	< .001		-.25	< .001
Athletic Identity		.14	.017		.19	.001		.20	< .001
Model 2	.053		.003	.013		.141	.003		.307
Self-Compassion		.10	.170		-.20	.007		-.21	.005
Athletic Identity		.08	.163		.20	< .001		.20	< .001
Emotional Stability		.06	.431		-.13	.092		-.07	.307
Openness		.12	.040						
Conscientiousness		.06	.332						
Self-Esteem		.18	.007		-.04	.548			

Once again, this pattern contradicts what would be expected from the authenticity perspective of self-compassion. Self-compassion and athletic identity consistently move in opposite directions and in the one instance in which they behave similarly – relating to positive affect – this pattern appears to mainly be attributable to self-esteem and somewhat to personality.

Discussion

The purpose of this study was to examine the factors that contribute to risk-taking, recovery strategy preference, and emotional experience in the context of sport injury. Overall, self-compassion, regulatory focus, and athletic identity did not appear to influence risk-taking, when measured concretely in terms of participants' acceptable time to return and the probability/severity of negative consequences. When considering an individual's preference for prevention-focused recovery strategies, however, those higher in self-compassion showed a greater preference for these approaches while those with a stronger athletic identity showed less preference. There was no indication that self-compassion is related to preference for promotion-focused recovery strategies, but a stronger athletic identity was related to greater promotion-focused strategy preference. Thus, in answer to the central research question, if an athlete is higher in self-compassion, they appear to be more likely to engage in self-protective approaches to rehabilitation, prioritizing their safety and well-being. Participants with a stronger athletic identity, in contrast to those with higher self-compassion, were more likely to endorse behavioural attempts to expedite recovery and return to their sport more quickly. This is in fact consistent with other research studying university student-athletes, where there was no relationship between athletic identity and ignoring practitioner recommendations, but a significant relationship with attempts to expedite recovery (Hilliard et al., 2017). Of note to this

research, self-compassion did not function similarly to athletic identity expression but showed an opposite pattern of relationships to most of the measures tested here.

While the measures of risk-taking did not show significant associations with self-compassion, regulatory focus, and athletic identity, the recovery and coping measures did. In both cases, self-compassion more closely aligned with the self-protection perspective as it encouraged participants to take a prevention-focused approach to recovery and had no relationship to overadherence. Importantly, the effects of self-compassion are not accounted for by prevention focus alone but in fact add to the effects of prevention focus in encouraging a cautious approach to recovery. While functionally similar, self-compassion and prevention focus each presented a unique source of information to predict prevention-focused strategy preferences and emotions. This pattern was replicated when examining emotional experiences as self-compassion negatively predicted negative affect and uncertainty above what can be accounted for by personality variables alone. The only exception was positive affect where greater reporting of positive affect by individuals higher in self-compassion was attributable to their also having higher self-esteem. Meanwhile, athletic identity works somewhat opposite to self-compassion regarding recovery strategies and coping. In this study, it appears that self-compassion primarily functions as a self-protective mechanism leading individuals to choose rehabilitation strategies that prioritize their safety, well-being, and avoidance of setbacks, rather than giving themselves permission to force their recovery and express their athletic identity. This self-protective stance appears to further mitigate negative affect and feelings of uncertainty, even as athletic identity can amplify these emotional experiences.

Self-compassion was positively associated with positive affect and negatively associated with both negative affect and uncertainty, in line with established conceptions of self-

compassion which identify it as a valuable construct for encouraging positive experiences and mitigating distressing emotions during challenging times. Interestingly, athletic identity was positively correlated with all three dimensions of emotion. While it is easily recognizable why a person with a stronger athletic identity would experience more negative affect and uncertainty than someone with a weaker athletic identity, why they would experience more positive affect is not immediately clear. I chose to explore this relationship using the "Basic Positive Emotion" subscales from the PANAS-X and discovered that athletic identity was positively correlated with the dimensions of "self-assurance" and "attentiveness". The self-assurance scale consists of the emotions of *proud, strong, confident, bold, daring, fearless*, while the attentiveness scale captures the emotions of *alert, attentive, concentrating, determined*. When considering the emotions at this level, it begins to make more sense why an athlete who has a stronger athletic identity may take more pride in their recovery efforts, emphasize their strength as they work to regain mobility and function, see themselves as bold, daring, or fearless as they take on this challenging experience, and remain alert, attentive, and determined in dedicating themselves to their recovery. Conversely, allowing oneself to experience these types of emotions may be a pre-existing feature which allowed these individuals to develop as athletes and leaders within the social context of sport that places high value on those specific emotions. To further illustrate this point, there was no significant relationship between athletic identity and "joviality", which captures emotions like *happy, joyful, delighted, cheerful, excited, enthusiastic, lively,* and *energetic*. If anything, one might expect there to be a negative relationship between these emotions and athletic identity, but it appears that all participants experienced these emotions to the same small degree regardless of athletic identity strength. Once again, the way self-

compassion interacts with emotional experiences is different from the way athletic identity interacts with emotions.

There has sometimes been disagreement as to whether self-compassion is a unique psychological construct or whether it is simply a reflection of personality and self-esteem. Previous research has demonstrated, however, that self-compassion is, in fact, distinct (Neff, 2011; Neff & Lamb, 2009; Neff & Vonk, 2009). In this study, self-compassion's relationship with more prevention-focused strategies, less ignoring, less negative affect, and less uncertainty survived after controlling for self-esteem and relevant Big-5 personality traits. Although self-compassion had the methodological advantage of being measured with more items in this research, all of the brief personality and self-esteem measures used here have been shown independently to reproduce the results of longer forms of these measures (Gosling et al., 2003; Raes et al., 2011). Thus, this pattern of results provides further support to the perspective that self-compassion operates distinctly from those other constructs.

Chapter 5: Discussion

Self-compassion is a valuable trait for a person to have when dealing with uncomfortable or distressing circumstances, as it offers many benefits and helps to mitigate challenges (Neff, 2023). Previous research has described these benefits both in terms of encouraging self-protection and in terms of promoting authentic expression of oneself. The main question of this research was which perspective self-compassion would more closely align with in the context of an athlete recovering from an injury, and in terms of the decisions they would make about the timing of their return to sport, risks they would be willing to tolerate, and recovery strategies they would prefer.

The evidence from my research supports the position that self-compassion encourages self-protection in this context. Self-compassion predicts endorsement of prevention-focused recovery strategies such as careful monitoring of progress and symptoms, approaching new rehabilitation activities with caution, and prioritizing the preservation of health and functioning. Although these preferences align with prevention focus, they are not simply reducible to this feature of how individuals may approach and frame decisions in many parts of their life. Self-compassion predicts strategy preference and likelihood of ignoring medical advice even after controlling for prevention and promotion regulatory focus, personality, and self-esteem.

In contrast, a strong athletic identity predicts the opposite pattern, encouraging promotion-focused strategies like seeking out additional treatment modalities, prioritizing returning to sport as soon as possible, and deviating from the recommended treatment plan by ignoring practitioner recommendations and attempting to expedite recovery. If self-compassion encouraged authentic expression of a person’s values and identity, one would expect to see

evidence of overlapping functions between higher self-compassion and athletic identity. In this research, however, they consistently operated directly counter to each other.

These questions are both oriented toward developing a better understanding of the factors that influence how people make decisions about what course of action to follow. Higgins and Silberman (1998) suggest regulatory focus is developed through the early socialization of young children to their environments and, importantly, significant people. They argue that by experimenting with and observing what types of behaviours evoke both positive and negative reactions from caregivers, children start to develop an internal framework for understanding how to frame their pursuits. For example, providing praise, affection, and nurturance when the child displays desired behaviours, overcomes difficulties, or engages in rewarding activities encourages a promotion-focus built on achieving ideal states. Whereas teaching the child to be alert to dangers or clean up their toys after playing encourages a prevention-focus built on maintaining safety and meeting obligations. Essentially, Higgins and Silberman (1998) suggest that regulatory focus develops through relation to external signals. The results of my research suggest that these signals do not appear to be the same ones that lead to the development of self-compassion. Instead, self-compassion seems to increase with age (Homan, 2016; Neff & Vonk, 2009; Potter et al., 2014; Przezdziecki, 2013) and a range of direct interventions that encourage the use of cognitive skills, mindful meditation, imagery, social connectedness, and more (Barnard & Curry, 2011).

A key and foreseeable limitation of this research was the use of a hypothetical scenario to capture participants' reactions to sport injury and rehabilitation decisions. To address this limitation, in Study 1, I validated the hypothetical scenario as something that participants could imagine happening to them, which would evoke strong emotions. Participants viewed the

scenario as realistic and had generally favourable perceptions of the recommended treatment plan, ensuring that any deviations from that plan represented individually motivated rehabilitation decisions and not simply a lack of trust in the scenario as described. Both qualitative and quantitative responses to Study 1 revealed that there were no alternatives that would be more common or believable, based on participants' actual experiences with sport injuries. I also validated the research measures independently, including the development of items to describe scenario-specific preferences for recovery strategies, and concurrent validation of these measures with existing measures of regulatory focus and rehabilitation overadherence. In Study 2, I further replicated a key finding, for validation purposes, that prevention and promotion focus each predict the corresponding strategies and not the non-corresponding strategies. These findings support the interpretation that the relationships found here between self-compassion and rehabilitation strategies are due to real differences in strategy-preferences and not are not simply an artifact of the methods used.

Although the authenticity perspective of self-compassion was not supported by my research, the effect has been shown in other settings (J. W. Zhang et al., 2019). For example, J. W. Zhang et al. (2019) demonstrated a relationship between self-compassion and authenticity, which they assessed using items that were specifically related to social interactions and how a person would conduct themselves in those settings (e.g., "I can be myself with others"; I feel artificial in my interactions with others"). However, the scenario in my study was not about public social behaviours but about private health decisions. Quite possibly, the self-compassionate athlete who had to withdraw from sport for self-preservation reasons would also be relatively open about this situation and how it was affecting them, rather than displaying bravado or false cheer, in their interactions with others. The goals of authenticity and self-

preservation may often be at odds, when looking within each domain, but are not necessarily at odds when crossing between domains.

One of the surprising results from Study 2 was the lack of relationship between self-compassion and the rehabilitation decisions measures (i.e., risk-taking and time to return), especially given that these measures were validated against the strategy and overadherence measures in Study 1. Based on those results, I expected that self-compassion would impact decision-making in a similar way to how it impacted rehabilitation strategies, but this was not the case. Instead, although the strategies people would employ in their recovery differed systematically between individuals higher vs. lower in self-compassion, there were no systematic differences between them in when they would return to sport and how much risk they would accept when doing so. This may suggest that, for example, if a person who is highly self-compassionate takes a relatively cautious approach to recovery yet expects to return to sport in a median amount of time, they may be taking a hopeful or optimistic view of their recovery. As greater dispositional optimism has been shown to predict shorter recovery times among post-surgical hospital patients (Scheier et al., 1989), it may be the case that self-compassion generates optimistic views of recovery, regardless of strategy, in turn facilitating a faster return to health.

Although athletic identity did not prove to be predictive of risk-taking, it still played an important part in a person's choices during rehabilitation. Athletic identity was associated with greater avoidance of prevention-focused rehabilitation strategies, attraction to promotion-focused strategies, and endorsement of various means of expediting recovery. It also predicted specific positive emotions that were in some ways hard to reconcile with the content of the injury scenario: i.e., feelings such as boldness or confidence. Interestingly, these relationships with athletic identity appear to be just as strong, if not stronger, than the relationships between self-

compassion and emotion. Many sport cultures celebrate ambitious goal achievement more than they reward safe, cautious, conservative self-protection. This is reflected in common adages like, "The best defense is a good offense." The talented goal-scorer who shows high upside potential (but is more prone to "cold-streaks" and slumps) gets more attention and is generally better paid than the consistently and predictably average performer. The greatest sign of respect for a defensive specialist tasked with preventing losses is that they never get talked about on the TV broadcast; they are so good at their job that the other team doesn't dare even challenge them. Athletes who are "playmakers" and "make things happen" draw praise and attention from coaches and talent evaluators, increasing the likelihood they will be selected for elite teams. The stronger an individual's sense of athletic identity, the more likely they may be to align with these messages and beliefs.

Popular culture is also filled with messages about the importance of athletic effort and outworking your competition. In seemingly every sports movie that features an underdog it is the protagonist's willingness to "go the extra mile" that leads to their triumph in the final act. The archetype of the "gym rat" who is the first to show up to practice and stays late after everyone else has gone home has become cliché. The reinforcement of these messages, present even from a very early age in youth sports, may lead athletes to believe that doing more is always better, and goal achievement is more important than loss prevention. This may even represent a case of survivorship bias where the people who continue to participate in sports into early adulthood are those who have found that sort of environment rewarding.

This messaging is consistent with and has likely contributed to the development of the "Sport Ethic" (Hughes & Coakley, 1991), the criteria used to define what it means to be a real athlete. These include dimensions such as making sacrifices for your sport, striving for

distinction (i.e., winning is the ultimate goal and losing is only accepted if it helps an athlete learn how to win), normalizing taking risks and playing through pain, and a refusal to accept limits in the pursuit of goals. While these concepts represent several aspects of what people enjoy and celebrate about sport culture, rigid overadherence to these ideals can have serious, harmful personal and social consequences. Rigidity in thinking and identity is often seen as an important risk factor for mental health concerns, while developing flexibility acts as both a preventative and therapeutic resource (Giommi et al., 2023). If self-compassion were to encourage authentic expression of identity, those with a strong sport ethic may be more likely to adhere to these rigid ideas of what it means to be an athlete and put themselves in unnecessarily risky positions.

Limitations and Future Directions

In any research it is important to acknowledge limitations of the study design. First, as noted above, this study utilized a hypothetical injury scenario. The reliance on hypothetical scenarios and hypothetical reactions within self-compassion research was previously identified as a weakness within the current literature (Röthlin, 2019). Previous research has shown that imagined scenarios are quite effective in eliciting similar reactions to real circumstances (Chan et al., 2011), however other research has shown that people do not always act in line with their own expectations (Armitage & Conner, 2001; Rhodes & Dickau, 2012; Sutton, 1998; Webb & Sheeran, 2006). Just because an individual believes they will or intends to act in a certain way if presented with a certain scenario does not mean they will follow through with that behaviour when presented with the situation for real. Further, the incentives and barriers presented in the hypothetical scenario may not fully reflect the reality of the situation or create the same balance of pressures. The individual may experience their options differently when they are tangibly

placed in front of them rather than when presented as part of a research study. For further discussion of the use of hypothetical scenarios in this type of research, see Appendix P.

The details of the hypothetical scenario, including the use of the term “serious recreational athlete”, may affect the validity of the findings. People participate in sports in a variety of ways and for a variety of reasons, such as recreationally for physical and mental health and social benefits, in competitive amateur settings, and professionally. Each of these contexts involve their own set of incentives and consequences for rehabilitation decisions. In this research I wanted to ensure that participants interpreted the hypothetical scenario as having multiple reasonable options that were free from coercion so as to better capture their preferences. If the scenario described a professional context where there were highly lucrative financial incentives to returning as quickly as possible, for example, then it may not have been clear whether the participant’s decisions reflected self-protection versus authenticity, or simply a recognition of contractual obligations and financial benefits. Future researchers may wish to consider these specific contextual factors when creating their own hypothetical scenarios or replicating the study with a different athlete population.

On the topic of different athlete populations, the second notable limitation is that these two studies were conducted with a population of undergraduate university students who self-identified as participating in competitive sports. The data collected regarding identifying sports as a passion supported the notion that while the definition of athlete was intentionally broad, the sample primarily consisted of individuals who participate in sport on a regular basis and for whom lost participation would be meaningfully distressing. Yet there may be characteristics of this subpopulation that do not apply uniformly to a broader population of interest. For example, some participants compete in university, national, or provincial competitions, while others

participate in more recreational competitions. This is not to suggest that the recreational activities do not have a competitive atmosphere, or the participants do not care deeply, but the overall setting is likely to be less uniform. A given injury also could have different meanings to athletes at different ages, such as a person involved in university as compared with masters athletics. For a younger athlete who is experiencing their first injury, they may be likely to enjoy a full recovery with very few if any long-term negative consequences. Meanwhile, for an older athlete or one with an already long injury history, they may find that each new injury corresponds with longer, more arduous, or incomplete recoveries and their risk tolerance may change. Further, self-compassion is positively associated with age (i.e., people are more self-compassionate later in life (Allen et al., 2012; Homan, 2016; Murn & Steele, 2020); although the age range of participants in the second study was quite wide, 17-52 years old, approximately 65% of the participants were either 18 or 19 years old. A sample of older athletes may show a greater tendency toward self-protection as the consequences of re-injury become more impactful and the tendency to act out of self-compassion develops across the lifespan.

In future research comparing subgroups of athletes, a particularly interesting comparison would be between athletes who have experienced a similar injury in the past versus those who have not. There is an established body of evidence that multiple factors contribute to how people perceive risks (Siegrist & Árvai, 2020). These factors include characteristics of the hazard itself, characteristics of the individual, and the heuristics that are used to assess for risk. Risks that are perceived as novel, incompletely understood, and psychologically distant (e.g., the effects are delayed in time) are associated with a higher level of acceptable risk for a given perceived benefit (Fischhoff et al., 1978). While the consideration of regulatory focus and self-compassion each represented ways to capture individual characteristics, having previous personal experience

with an injury could influence how "unknown" a hazard may be. This was demonstrated in Study 1, where participants who had experienced a similar situation before were able to more vividly imagine the hypothetical scenario happening. Further exploration of other factors that influence risk perception and how self-compassion may interact with these factors could be a valuable area for study.

Third, there was no attempt to control for the type of sport played. Some sports may preferentially select for certain regulatory focus or personality styles and risk-tolerance. Presumably, low- or no-contact sports like volleyball, badminton, or soccer involve taking less risk with one's physical health than collision sports like football or hockey or "extreme" sports like skateboarding. Individuals who have gravitated toward and continued to participate in these low-contact sports may have done so due to a lower level of risk tolerance in general. There was also no attempt to control for whether participants participated in individual or team sports. Team sports will often include a built-in social network of teammates who may either encourage or discourage risk-taking in recovery. A felt sense of obligation to others, isolation from important relationships, or competition within the team may lead one to take greater risk and attempt to expedite recovery. On the other hand, supportive teammates who remind an injured athlete that they are not alone in dealing with their injury or that other members can "pick up the slack" and contribute to the team while the injured athlete is recovering, and keep the injured athlete engaged with the team in other ways even if they are not able to participate as they usually would may make the rehabilitation process more tolerable and give them permission to take the time that is needed.

Fourth, as described in Chapter 2, the recommended structure and scoring of the Self-Compassion Scale continues to be a topic of debate. Depending on how a given researcher

conceptualizes self-compassion, the appropriate measurement instruments and scoring procedures may vary. It is possible that a different scoring method would have generated different results. Similarly, different versions of the Self-Compassion Scale exist, such as an athlete version (Killham et al., 2018). In this version, items are modified to include sport-specific language, such as "I'm tolerant of my own athletic flaws and inadequacies" or "I try to see my failings as part of the sport experience." As Killham et al., (2018) highlight, the intention of these changes is to orient athletes to think of how they treat themselves in a sport context rather than in general. In my research, I did this by presenting participants with the hypothetical injury scenario and asking them to respond to the questionnaire with that context in mind. Other researchers may choose to use the alternate version of the scale, however.

Fifth, the design of the study was correlational rather than experimental in nature. Because participants could not be randomly assigned to an injured vs. non-injured condition, or to have high self-compassion vs. low self-compassion, there are inherent limitations to the causal interpretation and applicability of the results. While it seems that self-compassion does not significantly impact risk-taking in the present naturalistic research design, the clinical application of this research would involve teaching and promoting self-compassion in a therapeutic context. Understanding how specifically encouraging someone to practice self-compassion when making decisions, rather than simply relying on how they tend to treat themselves in general when faced with difficult experiences, will be an important factor in how self-compassion interventions may be implemented.

Finally, the role of regulatory focus theory in the research requires further consideration here. In the context of this research, this theory helped to guide the development of measures of recovery strategy preference, and to demonstrate that the main function of self-compassion in

sport-injury rehabilitation is self-protection rather than authentic self-expression. However, previous authors have raised the issue that the concept of regulatory focus is ambiguously defined (see Summerville & Roese, 2008). Higgins (1997) originally presented regulatory focus in terms of motivation by distinct self-guides and attitudes toward the status quo as a reference point, and he used these definitions interchangeably. The self-guide definition suggests that promotion-focus represents motivation by ideals (e.g., goals, desires) while prevention-focus represents motivation by oughts (e.g., obligations, duties). The reference point definition, in contrast, describes promotion focus in terms of an emphasis on achieving a gain relative to the less desirable status quo, and a prevention focus in terms of an emphasis on avoiding a loss relative to the more desirable status quo. The items of the Regulatory Focus Questionnaire (Higgins, Friedman, Harlow, Idson, et al., 2001), used in this research, are written in line with the "ideals" (e.g., "I feel like I have made progress toward being successful in my life") and "oughts" (e.g., "Growing up, did you ever act in ways that your parents thought were objectionable?") of the self-guide definition. However, to the extent that the self-guide and reference point definitions can diverge in some situations (Summerville & Roese, 2008), it is important to note that other measures have been developed and could be used to examine sport injury rehabilitation decisions from the reference point perspective. Specifically, future research in this area could use an instrument such as the General Regulatory Focus Measure (Lockwood et al., 2002), which is framed in line with the reference point definition and includes items such as "In general, I am focused on preventing negative events in my life."

Clinical Significance and Impact

While the aim of this research was to expand the theoretical understanding of self-compassion in the context of rehabilitation, to the findings can also inform and guide practical

application. One of the recommendations from Cormier et al.'s (2023) review of the literature in self-compassion in sport was to consider whether self-compassion is domain-general or domain-specific. In this light, the motivation behind this research of understanding the possible dangers that athletes may face if they gravitate toward risky decisions and the role of self-compassion in encouraging or at least permitting those decisions represents an exploration of self-compassion in a specific domain. When considering the results of my research, while remembering the caution above that no causal inferences can be drawn directly from these correlational studies, self-compassion does not appear to lead to increased risk-taking. It is not associated with overadherence, and, if anything, may serve to reduce ignoring of practitioner recommendations and efforts to expedite recovery. Kowalski et al. (Kowalski et al., 2023) recently presented a step-by-step approach that sport participants (e.g., athletes, coaches, parents, service providers) can use to help manage difficult experiences in sport. Included in this was a reminder that while self-compassion contributes positively to sport performance, it is equally important that self-compassion promotes well-being. The results of my research provide some reassurance for clinicians that utilizing these types of interventions is unlikely to lead to a negative consequence like inappropriate risk-taking.

In a very recent study of combat sport athletes, published while this dissertation was in preparation, athletes higher in self-compassion were more likely to follow the advice of medical practioners and adhere to return-to-play protocols following a concussion (Wortley & Schellenberg, 2025). Notably, this study also presented participants with a hypothetical scenario in which they were asked to "imagine that they had just experienced a concussion while participating in their sport, and then to rate the likelihood that they would follow each [recovery] recommendation" (Wortley & Schellenberg, 2025, p. 244).

There is also no evidence from my research to suggest that self-compassion leads to greater emotional distress. Rather, the present findings add to the body of evidence that self-compassion is effective in mitigating distressing emotions. In total, the possible worry that self-compassion would lead to negative or dangerous outcomes is not supported. Clinicians have a responsibility to provide interventions that provide more benefits than the risks they present. In this case, clinicians can be reassured that clients can expect the same benefits already established as outcomes of self-compassion interventions without introducing unnecessary risks or side effects.

The present findings were less reassuring about the potential risks and benefits of a strong athletic identity. Helping athletes make non-athletic parts of their identity more salient may reduce the likelihood of overadherence. Psychotherapy provides an environment in which to challenge, question, and develop beliefs about oneself that make up a sense of identity. One would be hard-pressed to find a school of psychotherapy where a person's sense of identity is irrelevant to the therapeutic process. This is true whether it is through the examination and challenging of core beliefs central to cognitive behaviour therapy, developing increased psychological flexibility and exploration of personal values important in acceptance and commitment therapy, understanding early relationships and how they shape the attitudes that can be transferred onto other people in one's world, and so on. As clinicians, creating opportunities for clients to develop and expand their identity beyond simply athletics represents an important and valuable component of the injury rehabilitation process.

Expanding one's sense of identity can also have beneficial impacts on their emotional experience. If an athlete is already experiencing positive emotions while going through their recovery process, then they are unlikely to be seeking out support from a psychologist as they are

probably coping successfully on their own. If they are experiencing negative emotion or significant feelings of uncertainty, however, helping them to view their identity in a multi-faceted way that decreases the emphasis on being an athlete could help reduce this discomfort without increasing the risk of possibly dangerous decision-making.

Another practical implication that warrants mention is the translation of planned behaviour into executed behaviour. Self-compassion is positively associated with not only the intention to engage in health behaviours (Sirois, 2015), but also the execution of those health behaviours (Sirois et al., 2015). Self-compassionate people are also less self-critical and engage in less procrastination (Sirois et al., 2019). In one study of follow through on exercise behaviour, there was a greater discrepancy between planned and actual activity among high procrastinators than low procrastinators, but even among procrastinators, those with higher self-compassion were better able to follow through on their plans (Rapoport et al., 2022). Whatever the recovery strategies people prefer and the risk-taking decisions they make, self-compassion may help people to follow through on their intentions.

The results of my research can also be framed in the context of other theoretical approaches, such as Compassion-Focused Therapy (P. Gilbert, 2009). Compassion-Focused Therapy has developed from a recognition that some people, specifically those with high shame and self-criticism, have difficulty creating feelings of warmth, soothing, and safety. It is posited that these feelings are part of an affect regulation system focused on finding contentment, safety, and connection with others and that this system operates in balance with two others: the drive system that seeks to acquire resources and find pleasure; and the threat protection system that is sensitive and responds to signs of danger. The theory suggests that people who experience high levels of shame and self-criticism do so because their primary affect regulation system is that of

threat protection while their soothing system is relatively underactive. This makes it difficult for them to calm themselves, foster social-connectedness, and accurately interpret and calibrate signs of danger. Gilbert (2009) suggests that by helping people feel safe, comfortable, soothed, and cared for, therapists can help their clients learn to activate and utilize this soothing system for themselves. This process of recognizing distress in others, treating them with kindness, and building connection in an effort to help is the definition of compassion – learning to do that for yourself is the act of practicing self-compassion.

Recent meta-analyses and systematic reviews documenting the effectiveness of psychological treatments utilizing this approach have highlighted reductions in overall negative mental health outcomes, depression, and self-criticism while improving compassion for self and others (Petrocchi et al., 2023), decreases in self-criticism and increases self-soothing (Vidal & Soldevilla, 2023), and increases in self-compassion and self-reassurance along with decreases in self-criticism, fear of self-compassion, depression, and eating disorders among clinical populations (Millard et al., 2023). This theory, in which a person can learn to activate this "soothing" affect regulation system and in turn take actions to care for themselves is consistent with the results of my research which suggest self-compassion operates by activating a desire to protect oneself during difficult times.

Concluding Statements

Choosing to participate in a sport involves taking an inherent risk by exposing oneself to the possibility of injury. Not only sport participation but also activities of daily living can be affected by sport injuries. Equipping athletes with the tools they need to successfully cope with and navigate injuries is a goal of clinicians who support athletes, but to do so ethically they must be aware of the potential risks that are part of a given intervention. The research presented here

supports existing research identifying self-compassion as an effective approach to dealing with difficult or uncomfortable emotions, while alleviating possible concerns that it could lead to increased risk-taking and athletes putting themselves back into harm's way before their bodies are sufficiently recovered. Further, the results of this research suggest that trait self-compassion predicts a preference for rehabilitation strategies that aim to prevent further harm while healing, and avoidance of strategies outside of medical recommendations that may be used to augment or accelerate recovery and return to play. The findings thus provide a new foundation for further clinical research, highlighting the differences between a person's emotional experiences of a challenging situation and the behavioural decisions they make as they choose how to respond to the situation. This understanding can help inform clinical research and practice in the areas of self-compassion and sport injury rehabilitation.

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Appendices A-M – Research Instruments

Appendix A

Sport Participation Profile

This survey is about your participation in sports. We are particularly interested in your participation in competitive sports. For purposes of this questionnaire, please consider the term "competitive" to mean that you practice or participate in your sport regularly, meaning one or more times per week, and that you have participated or plan to participate in one or more organized events per year with other participants in the same sport. An organized event could be a scheduled team practice, a workshop or clinic to learn more about the sport or improve performance, a fun run or intramural match, or any more frequent and higher-level training/competition up to and including national-level amateur and professional athletics.

Have you participated in any competitive sports in the past 12 months from today?

Yes [ ] No [ ]

Do you plan to participate in any competitive sports in the next 12 months from today?

Yes [ ] No [ ]

In what competitive sports do you currently participate the most (list up to 3 sports).

Sport 1: _____ Sport 2: _____ Sport 3: _____

For the first listed sport…

…for how many years have you been participating in this sport at a competitive level (as defined above)?

_____

…how many hours per week do you currently spend training for this sport?

_____

For the second listed sport…

…for how many years have you been participating in this sport at a competitive level (as defined above)?

_____

…how many hours per week do you currently spend training for this sport?

_____

For the third listed sport…

…for how many years have you been participating in this sport at a competitive level (as defined above)?

_____

…how many hours per week do you currently spend training for this sport?

_____

Regarding your answers above, is there anything else we should know about special circumstances affecting your current competitive sport participation?

_____
_____
_____

Appendix B

Passion Scale[10] (Marsh et al., 2013; Vallerand et al., 2003; 2010)

Please indicate the extent to which you agree or disagree with each statement as it relates to the first sport you listed above.

1. I spend a lot of time doing this activity.

Do not agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1	2	3	4	5	6	7

2. I love this activity.

Do not agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1	2	3	4	5	6	7

3. This activity is important for me.

Do not agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1	2	3	4	5	6	7

4. This activity is a passion for me.

Do not agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Very strongly agree
1	2	3	4	5	6	7

[10] Adapted from "Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages," by H. W. Marsh, R. J. Vallerand, M. K. Lafreniere, P. Parker, A. J. S. Morin, N. Carbonneau, S. Jowett, J. S. Bureau, C. Fernet, F. Guay, A. Salah Abdulijabbar, and Y. Paquet, 2013, *Psychological Assessment,* 25(3), 796-809, https://doi.org/10.1037/a0032573. Copyright 2013 by American Psychological Association

Appendix C

Hypothetical Injury Scenario Immersion and Engagement Checks

> Imagine that you are a serious recreational athlete who has suffered a knee injury and had ACL reconstruction surgery. This is a surgery to replace a torn Anterior Cruciate Ligament, which is a major ligament in your knee. Your doctor's projected timeline for your return to health (i.e., normal function) is 9 months, and return to any type of training or competition in your sport could be in the range of 8 – 12 months. With injuries of this type, there is a risk of re-injury. However, after 6 months of progressive physical therapy, you are feeling reasonably well, if not 100% recovered yet. You decide to contact your doctor about your personal risk of re-injury if you return to sport at this point in time, now.

How easy or hard is it for you to imagine this scenario happening to you?

Very easy 1 2 3 4 5 6 7 Very hard

As you try to imagine this scenario happening to you, does it seem more real or more abstract?

More real 1 2 3 4 5 6 7 More abstract

If this scenario were really happening to you, how worried would you be about your recovery timeline?

A little or not at all	Somewhat	Very	Extremely
0	1	2	3

How preoccupied would you be with your decision while waiting to see your doctor?

A little or not at all	Somewhat	Very	Extremely
0	1	2	3

Have you ever experienced this type of situation?

Yes [ ]
No [ ]

What is the most similar situation you have experienced? What were the worst features of that similar situation, and were they any positive features?

_____

_____

_____
_____

If you actually suffered this injury right now, would it interfere with any sport participation goals or plans you have at the present time?

Yes [ ]
No [ ]

If yes, how disruptive would this injury be to your current goals or plans?

Not at all			Somewhat			Very much
1	2	3	4	5	6	7

In as much detail as possible, please describe the hypothetical scenario you were presented with at the beginning of the study.

_____

_____

_____

_____

What part of the body was injured in the hypothetical scenario?

a) Shoulder

b) Knee

c) Hip

d) Wrist

I found the experience of thinking about and answering questions related to the scenario:

Uninteresting 1 2 3 4 5 6 7 Interesting

Boring	1	2	3	4	5	6	7	Engaging
Worthless	1	2	3	4	5	6	7	Worthwhile
Unimportant	1	2	3	4	5	6	7	Important

How much effort did you make in responding to this survey? Your honesty is greatly appreciated.

Very little or none at all	A little effort	Moderate effort	Quite a bit of effort	A lot of effort
1	2	3	4	5

If you answered all of the questions honestly, write YES in the text box

[_____]

Age (in years): _____

Gender: Woman [ ] Man [ ] I identify my gender as: _____ (please specify)

Appendix D

Treatment Plan Perceptions

Recovery from ACL surgery typically involves progressive physical therapy, combined with pain medication and use of mobility aids, each of which involves a number of other related lifestyle decisions. As such, each person's attitude towards the treatment plan recommended by their physician is somewhat unique. The following questions relate to your intention to follow the recommended treatment plan.

Attitude

Adhering to the recovery plan recommended to me by my physician would be _____

1. Unreasonable 1 2 3 4 5 6 7 Reasonable
2. Feasible 1 2 3 4 5 6 7 Unfeasible
3. Ineffective 1 2 3 4 5 6 7 Effective

The recovery plan recommended to me by my physician is _____

4. Too cautious About right Too aggressive

   1 2 3 4 5 6 7

Subjective Norms

5. Most people who are important to me would approve of me adhering to my physician's recommended recovery plan

   Agree 1 2 3 4 5 6 7 Disagree

6. Most people like me who suffered a similar injury would adhere to their physician's recommended recovery plan

   Unlikely 1 2 3 4 5 6 7 Likely

Perceived Behavioural Control

7. I am confident that I could adhere to my physician's recommended recovery plan

   False 1 2 3 4 5 6 7 True

8. Adhering to my physician's recovery plan is up to me

   Agree 1 2 3 4 5 6 7 Disagree

Intention

9. I intend to adhere to the treatment plan recommended by my physician.

   Not at all 1 2 3 4 5 6 7 Completely

10. How likely is it that you will adhere to the treatment plan recommended by your physician?

    Very likely 1 2 3 4 5 6 7 Very unlikely

Appendix E

Risk-Taking Measures and Qualitative Feedback Prompts

1. At what level of probability would you decide to return to participating in your sport? In other words, if the doctor said your probability of re-injury was less than _____%, you would decide to resume participating now.
2. At what level of consequences would you decide to return to participating in your sport? In other words, if the doctor said that re-injury would set you back by ____% of the progress you had made in the last 6 months, you would decide to resume participating now.
3. At what level of severity of re-injury would you decide to return to participating in your sport? In other words, if the doctor said that re-injury would cost you ____% of your ability to participate (i.e., 0% means you would return to your normal participation eventually, 100% means you would never be able to participate in the same way again), you would decide to resume participating now.
4. Some injuries can be the result of gradual wear-and-tear on your body that is a predictable part of participating in sport, while others are more often the result of collisions, accidents, or other unpredictable events. At what level of predictability would you decide to return to participating in your sport? In other words, if the doctor said the predictability of re-injury was less than ____% (i.e., 0% means completely unpredictable and 100% means completely predictable), you would decide to resume participating now.
5. Given the above description of both typical recovery from ACL surgery and your personal recovery to date, at what point in time between 6 months and 12 months would you expect to return to participating in your sport?

6 months 9 months 12 months

|----------|----------|

6. What other questions, if any, might you have for your doctor in deciding when to return to participating in your sport?

_____

_____

_____

_____

7. What other pieces or sources of information, if any, would you consider in deciding when to return to participating in your sport?

_____

_____

_____

_____

Appendix F

Rehabilitation Overadherence Questionnaire[11] (ROAQ; Podlog, Gao, Kenow, Kleinert, Granquist, Newton, & Hannon, 2013)

1. How frequently would you ignore your physician's advice to avoid pushing through unwanted pain?

   Never 1 2 3 4 5 Always

2. How frequently would you ignore your physician's recommendations to avoid specific exercises or activities?

   Never 1 2 3 4 5 Always

3. How frequently would you avoid reporting pain to your physician?

   Never 1 2 3 4 5 Always

4. How frequently would you hide pain about your injury from doctors or other rehabilitation experts?

   Never 1 2 3 4 5 Always

5. How frequently would you ignore your physician's recommendations to avoid "doing too much too soon" in your rehabilitation?

   Never 1 2 3 4 5 Always

6. How frequently would you try to catch up with other athletes who are further ahead in their rehabilitation?

   Never 1 2 3 4 5 Always

[11] Adapted from "Injury Rehabiltiation Overadherence: Preliminary Scale Validation and Relationships With Athletic Identity and Self-Presentation Concerns," by L. Podlog, Z. Gao, L. Kenow, J. Kleinert, M. Granquist, M. Mewton, and J. Hannon, 2013, *Journal of Athletic Training, 48*(3), 372-381, doi: 10.4085/1062-6050-48.2.20. Copyright 2013 by the National Athletic Trainers' Association, Inc.

7. How frequently would you perform more rehabilitation exercises than your physician recommends?

   Never 1 2 3 4 5 Always

8. In thinking about my rehabilitation I think that my family or teammates would be concerned if I ignore my athletic therapist's advice to limit the rehabilitation exercises I perform

   Strongly disagree 1 2 3 4 5 Strongly agree

9. In thinking about my rehabilitation I think it is usually better to do too much rehabilitation than not enough

   Strongly disagree 1 2 3 4 5 Strongly agree

10. In thinking about my rehabilitation I believe I must progress as quickly as possible in order to avoid losing physical fitness

    Strongly disagree 1 2 3 4 5 Strongly agree

Appendix G

Self-Compassion Scale[12] (SCS; Neff, 2003)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.
_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
_____ 5. I try to be loving towards myself when I'm feeling emotional pain.
_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
_____ 8. When times are really difficult, I tend to be tough on myself.
_____ 9. When something upsets me I try to keep my emotions in balance.
_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.
_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
_____ 14. When something painful happens I try to take a balanced view of the situation.
_____ 15. I try to see my failings as part of the human condition.
_____ 16. When I see aspects of myself that I don't like, I get down on myself.
_____ 17. When I fail at something important to me I try to keep things in perspective.
_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
_____ 19. I'm kind to myself when I'm experiencing suffering.
_____ 20. When something upsets me I get carried away with my feelings.
_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
_____ 23. I'm tolerant of my own flaws and inadequacies.
_____ 24. When something painful happens I tend to blow the incident out of proportion.
_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.

[12] From "Development and Validation of a Scale to Measure Self-Compassion," by K. Neff, 2003, *Self and Identity, 2,* 223-250. Copyright 2003 by Kristin Neff. Reprinted with permission.

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Appendix H

Regulatory Focus Questionnaire[13] (RFQ; Higgins et al., 2001)

1. Compared to most people, are you typically unable to get what you want out of life?

   1 2 3 4 5

   Never or seldom Sometimes Very often

2. Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?

   1 2 3 4 5

   Never or seldom Sometimes Very often

3. How often have you accomplished things that got you "psyched" to work even harder?

   1 2 3 4 5

   Never or seldom A few times Very often

4. Did you get on your parents' nerves often when you were growing up?

   1 2 3 4 5

   Never or seldom Sometimes Very often

5. How often did you obey rules and regulations that were established by your parents?

   1 2 3 4 5

   Never or seldom Sometimes Very often

6. Growing up, did you ever act in ways that your parents thought were objectionable?

   1 2 3 4 5

   Never or seldom Sometimes Very often

[13] From "Achievement orientations from subjective histories of success: Promotion pride versus prevention pride," by E. T. Higgins, R.S. Friedman, R. E. Harlow, L. C. Idson, O. N. Ayduk, and A. Taylor, 2001, *European Journal of Social Psychology,* 31, 3-23. Copyright 2001 by John Wily & Sons, Ltd.

7. Do you often do well at different things that you try?

1	2	3	4	5
Never or seldom		Sometimes		Very often

8. Not being careful enough has gotten me into trouble at times.

1	2	3	4	5
Never or seldom		Sometimes		Very often

9. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do.

1	2	3	4	5
Never true		Sometimes true		Very often true

10. I feel like I have made progress toward being successful in my life.

1	2	3	4	5
Certainly false				Certainly true

11. I have found that very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.

1	2	3	4	5
Certainly false				Certainly true

Appendix I

Regulatory Focus Recovery Strategies

Recovery from ACL surgery typically involves progressive physical therapy, combined with pain medication and use of mobility aids, each of which involves a number of other related lifestyle decisions. As such, each person's approach to recovery is somewhat unique. How much would your approach match the following statements?

Very unlike my approach	A little unlike my approach	Neutral	A little like my approach	Very much like my approach
1	2	3	4	5

_____ My main focus would be preserving my health and functioning of my knee.

_____ My main focus would be recovering my health and getting back to sport participation as quickly and fully as possible.

_____ I would adhere to my doctor's recommendation of time away from participating in my sport, regardless of how I was feeling.

_____ I would wait as long as necessary to feel 100% recovered before undertaking any sport-related activities.

_____ I would look for every opportunity to hasten my recovery and return to participating in my sport as quickly as possible.

_____ I would seek out additional treatments and exercises (e.g., cryotherapy, yoga) to recover more quickly.

_____ I would closely monitor my pain and symptoms in the hope of not making my situation worse through my activities.

_____ I would seek to avoid re-injury at all costs.

_____ My motto during this time would be, “You miss 100% of the shots you don’t take.”

_____ My motto during this time would be, “Better safe than sorry.”

Key:

1) Prevention
2) Promotion
3) Prevention
4) Prevention
5) Promotion
6) Promotion
7) Prevention
8) Prevention
9) Promotion
10) Prevention

Appendix J

Positive and Negative Affect Schedule – Expanded Form[14] (PANAS-X; Watson & Clark, 1994)

How likely is it that you would have each of the following feelings in relation to important decisions about your care and recovery?

1 very slightly or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
_____ cheerful	_____ sad	_____ active	_____ angry at self	
_____ disgusted	_____ calm	_____ guilty	_____ enthusiastic	
_____ attentive	_____ afraid	_____ joyful	_____ downhearted	
_____ bashful	_____ tired	_____ nervous	_____ sheepish	
_____ sluggish	_____ amazed	_____ lonely	_____ distressed	
_____ daring	_____ shaky	_____ sleepy	_____ blameworthy	
_____ surprised	_____ happy	_____ excited	_____ determined	
_____ strong	_____ timid	_____ hostile	_____ frightened	
_____ scornful	_____ alone	_____ proud	_____ astonished	
_____ relaxed	_____ alert	_____ jittery	_____ interested	
_____ irritable	_____ upset	_____ lively	_____ loathing	
_____ delighted	_____ angry	_____ ashamed	_____ confident	
_____ inspired	_____ bold	_____ at ease	_____ energetic	
_____ fearless	_____ blue	_____ scared	_____ concentrating	
_____ disgusted with self	_____ shy	_____ drowsy	_____ dissatisfied with self	
_____ torn	_____ uncertain	_____ ambivalent	_____ conflicted	

[14] Adapted from "The PANAS-X: Manual for the Positive and Negative Affect Schedule – Expanded Form," by D. Watson and L. A. Clark, 1994, University of Iowa. Copyright 1994 by David Watson and Lee Anna Clark.

Appendix K

AIMS-Plus[15] (Cieslak, 2004)

Please circle the number that best reflects the extent to which you agree or disagree with each statement in relation to your own sports participation.

1. I consider myself an athlete.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

2. I have many goals related to sport.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

3. Most of my friends participate in sport.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

4. Sport is the most important part of my life.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

5. I spend more time thinking about sport than anything else.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

6. Other people see me as an athlete.

Strongly Disagree — Neutral — Strongly Agree

0 10 20 30 40 50 60 70 80 90 100

[15] From "Describing and Measuring the Athletic Identity Construct: Scale Development and Validation," by T. J. Cieslak II, 2004, [Doctoral dissertation, Ohio State University]. Copyright 2004 by Thomas Joseph Cieslak II.

7. I feel bad about myself when I play poorly in practice or competition

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

8. Sport is the only important thing in my life.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

9. I would be very depressed if I were injured and could not compete in sport.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

10. When I am participating in sport, I am happy.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

11. My family expects me to participate in sport.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

12. I feel badly when I fail to meet my athletic goals.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

13. Being an athlete is who I am and I want to make a career of sport.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

14. It is important that other people know about my sport involvement.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

15. I get a sense of satisfaction when participating in sport.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

16. My participation in sport is a very positive part of my life

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

17. I typically organize my day so I can participate in sports

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

18. I would be very depressed if I were cut from the team and could not compete in sport.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

19. I participate in sport for the recognition/fame.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

20. My sports involvement has influenced my day-to-day decision-making

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

21. Being an athlete is an important part of who I am.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

22. I feel good about myself when I play well in practice or competition.

Strongly Disagree					Neutral					Strongly Agree
0	10	20	30	40	50	60	70	80	90	100

Appendix L

Ten-Item Personality Inventory[16] (TIPI; Gosling, Rentfrow, & Swann, 2003)

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

I see myself as:

1. _____ Extraverted, enthusiastic.
2. _____ Critical, quarrelsome.
3. _____ Dependable, self-disciplined.
4. _____ Anxious, easily upset.
5. _____ Open to new experiences, complex.
6. _____ Reserved, quiet.
7. _____ Sympathetic, warm.
8. _____ Disorganized, careless.
9. _____ Calm, emotionally stable.
10. _____ Conventional, uncreative.

[16] From "A Very Brief Measure of the Big Five Personality Domains," by S.D. Gosling, P. J. Rentfrow, and W. B. Swann Jr., 2003, *Journal of Research in Perosnality, 37*, 504-528, doi:10.1016/S0092-6566(03)00046-1. Copyright 2003 by Elsevier Science (USA).

Appendix M

Single-Item Self-Esteem Scale[17] (SISE; Robins, Hendin, & Trzesniewski, 2001)

I have high self-esteem

1	2	3	4	5
Not very true of me				Very true of me

[17] Adapted from "Measuring Global Self-Esteem: Construct Validation of a Single-Item Measure and the Rosenberg Self-Esteem Scale," by R. W. Robins, H. M. Hendin, and K. H. Trzesniewski, 2001, *Personality and Social Psychology Bulletin, 27,* 151-161. Copyright 2001 by the Society for Personality and Social Psychology, Inc.

Appendices N & O – Additional Analyses

Appendix N

Additional Athletic Identity Analyses

With a sample size of n = 278 after exclusions due to missing data and including multiple interaction effects, the analyses presented in this Appendix are certainly underpowered and exploratory at best. They should be interpreted with the appropriate level of caution.

Table 22

Recovery Strategy Preference Based on Self-Compassion and Athletic Identity Interaction Effects

	Recovery Strategies						Overadherence					
	Prevention-Focused			Promotion-Focused			Ignoring			Expediting		
Predictor	ΔR^2	β	p	ΔR^2	β	p	ΔR^2	β	p	ΔR^2	β	p
Model 1	.077		< .001	.033		.004	.040		.004	.029		.018
Self-Compassion		.23	< .001		.05	.373		-.18	.003		-.10	.101
Athletic Identity		-.17	.003		.19	.002		.10	.091		.15	.015
Model 2	.001		.594	.004		.257	.000		.742	.026		
Self-Compassion		.23	< .001		.06	.331		-.18	.003		-.09	.146
Athletic Identity		-.17	.003		.19	.001		.10	.092		.15	.014
Self-Compassion x Athletic Identity		-.03	.594		-.07	.257		-.02	.742		-.16	.007

Table 23

Intercorrelations Between AIMS-Plus Subscales and Risk-Taking

AIMS-Plus Subscale	Aggregated Risk-Taking	Time to Return
Social Identity	.08	.09
Exclusivity	.09	.09
Self-Identity	.03	.13*
Negative Affectivity	.05	.13*
Positive Affectivity	-.05*	.05

Note: * $p < .05$

Table 24

Risk-Taking Based on AIMS-Plus Subscales

Predictor	Aggregated Risk-Taking			Time to Return		
	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.003		.626	.025		.077
Self-Compassion		-.03	.593		-.05	.451
Positive Affectivity		-.05	.396		-.14	.152
Negative Affectivity					.24	.014
Model 2	.000		.775	.005		.491
Self-Compassion		-.03	.598		-.04	.478
Positive Affectivity		-.10	.120		-.13	.185
Negative Affectivity					.23	.023
Self-Compassion x Positive Affectivity		.02	.775		.08	.404
Self-Compassion x Negative Affectivity					-.01	.955

Table 25

Intercorrelations Between AIMS-Plus Subscales and Recovery Strategy Preference

AIMS-Plus Subscale	Prevention-Focused Strategies	Promotion-Focused Strategies
Social Identity	-.13*	.15*
Exclusivity	-.13*	.19**
Self-Identity	-.17**	.22***
Negative Affectivity	-.21***	.17**
Positive Affectivity	-.06	.13*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 26

Recovery Strategy Preference Based on AIMS-Plus Subscales

Predictor	Prevention-Focused Strategies			Promotion-Focused Strategies		
	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.092		< .001	.061		.009
Self-Compassion		-.22	< 001		-.07	.273
Social Identity		-.04	.690		-.10	.307
Exclusivity		.09	.416		.03	.814
Self-Identity		-.13	.294		.29	.028
Negative Affectivity		-.14	.086		.12	.253
Positive Affectivity					-.13	.222
Model 2	.002		.948	.017		.424
Self-Compassion		-.22	< .001		-.08	.478
Social Identity		-.04	.690		-.11	.270
Exclusivity		.09	.416		.02	.876
Self-Identity		-.12	.294		.28	.031
Negative Affectivity		-.14			.11	.299
Positive Affectivity			.120		-.09	.383
Self-Compassion x Social Identity		-.05	.641		.17	.139
Self-Compassion x Exclusivity		.03	.772		-.06	.587
Self-Compassion x Self-Identity		.01	.946		-.08	.558
Self-Compassion x Negative Affectivity		-.04	.668		-.13	.193
Self-Compassion x Positive Affectivity					.02	.848

Table 27

Intercorrelations Between AIMS-Plus Subscales and Emotional Experience

AIMS-Plus Subscale	Positive Affect	Negative Affect	Uncertainty
Social Identity	.13*	.14*	.14*
Exclusivity	.15*	.13*	.16**
Self-Identity	.16**	.18**	.18**
Negative Affectivity	.10	.22***	.20***
Positive Affectivity	.14*	.08	.10

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 28

Emotional Experiences Based on AIMS-Plus Subscales

Predictor	Positive Affect			Negative Affect			Uncertainty		
	ΔR^2	β	*p*	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.088		< .001	.134		< .001	.102		< .001
Self-Compassion		.25	< 001		-.28	< .001		-.24	< .001
Social Identity		-.05	.610		.04	.307		.00	.974
Exclusivity		.08	.509		-.14	.207		.01	.953
Self-Identity		.07	..585		.19	.131		.13	.291
Negative Affectivity					.15	.072		.09	.267
Positive Affectivity		.06	.501						
Model 2	.012		.486	.015		.303	.009		.612
Self-Compassion		.26	< .001		-.29	< .001		-.25	< .001
Social Identity		-.06	.583		.04	.701		.00	.982
Exclusivity		.08	.467		-.15	.169		.01	.938
Self-Identity		.06	.640		.20	.101		.13	.299
Negative Affectivity					.15	.069		.09	.269
Positive Affectivity		.06	.462						
Self-Compassion x Social Identity		.05	.643		.11	.287		.13	.216
Self-Compassion x Exclusivity		-.09	.434		.06	.603		-.05	.655
Self-Compassion x Self-Identity		-.04	.742		.00	.972		.00	.978
Self-Compassion x Negative Affectivity					-.08	.307		-.21	.837
Self-Compassion x Positive Affectivity		-.03	.759						

Appendix O

Treating Risk-Taking as Four Separate Dimensions

Table 29

Correlations with Dimensions of Risk-Taking

Variable	Probability	Consequence	Severity	Predictability
Probability	--			
Consequence	.29***	--		
Severity	.23***	.44***	--	
Predictability	.17**	.20***	.17**	--
Time to Return	.02	.10	.12*	-.13*
Self-Compassion	-.01	.05	.07	.02
Promotion Focus	.03	-.05	-.07	-.01
Prevention Focus	.00	-.08	-.06	.01
Extraversion	.07	.05	.10	.00
Agreeableness	-.02	-.06	-.08	-.09
Conscientiousness	-.02	.01	.08	.06
Emotional Stability	-.07	.07	.07	.00
Openness to Experience	.06	.14*	.12*	-.06
Self-Esteem	-.07	.04	.12*	.01

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 30

Individual Dimensions of Risk-Taking

Predictor	Risk-Taking Dimension					
	Consequence			Severity		
	ΔR^2	β	*p*	ΔR^2	β	*p*
Model 1	.014		.226	.017		.167
Self-Compassion		.09	.148		.11	.071
Promotion Focus		-.07	.284		-.10	.133
Prevention Focus		-.08	.186		-.05	.375
Model 2	.019		.017	.029		.011
Self-Compassion		.07	.282		.04	.549
Promotion Focus		-.10	.120		-.16	.016
Prevention Focus		-.06	.326		-.03	.648
Openness to Experience		.14	.017		.12	.053
Self-Esteem					.14	.034

Appendix P – Ancillary Discussion

The Accuracy of Forecasting

These two studies not only utilized a hypothetical, rather than real, injury scenario, but also asked participants to predict what they would do in that scenario rather than engage in those behaviours. This prediction is a more difficult task than it may seem at first glance and trying to accurately predict one's own future experiences, let alone their behaviours, is far from foolproof.

Predicting one's emotional experience consists of predicting the valence of emotions, the specific emotions experienced, their intensity, and their duration (Wilson & Gilbert, 2003). Although people are generally quite good at predicting the valence of the emotions they will feel in response to an event (e.g., Wilson et al., 2004) and reasonably accurate in predicting the specific emotions they will feel (e.g., Robinson & Clore, 2001; Wilson et al., 2004), they tend to overestimate both the duration and intensity of their emotional reactions (Wilson & Gilbert, 2003). To further complicate this task, people are often better at acknowledging the complex range of emotions they will feel if asked to predict their response to something in the near (rather than distant) future (Liberman et al., 2002). For example, if a person is asked how they would feel if a friend invited them out to dinner next year, they may respond that they would feel pleased. If the invitation was for the next *day*, however, they may report that they would feel pleased to have the invitation but also disappointed that they aren't available, guilty for cancelling on their friend yet again, jealous of those who are able to go, motivated to plan a different occasion, etc.

In the present research, participants were asked to predict how they would feel in response to the hypothetical scenario. Participants anticipated that they would feel roughly equal degrees of positive, negative, and uncertainty emotions. Previous research would suggest that

while they may have been accurate in predicting the valence of and specific emotions they would feel, they may not have accurately captured the full range of relevant emotions or their impact. Is there evidence to suggest that self-compassion would influence forecasting accuracy? Some researchers have proposed the concept of a "psychological immune system" that protects against the negative effects of stress (Olah, 2000), while others (D. T. Gilbert & Wilson, 2000) theorized that the psychological immune system consists of various biases and mechanisms that protect against negative emotional experiences; thus the errors seen in affective forecasting. More recently, other researchers have proposed the concept of "psychological pathogens" which comprise psychological factors that detract from well-being and "psychological adaptogens" which protect from stress and improve well-being (Gupta & Pandey, 2014). Self-compassion has been proposed as one such psychological adaptogen, consistent with the existing literature relating self-compassion to mental health and well-being. If practicing greater self-compassion is a known method for protecting oneself from distress, and errors in forecasting also reduce distress, it may be possible that self-compassion is providing the mechanism through which errors in forecasting occur. To illustrate, self-compassion is characterized by greater mindfulness, decreased rumination, facilitation of social connection through recognition of common humanity, and greater self-kindness. These all represent adaptive coping skills a person may be able to employ when faced with a challenging event, decreasing both the impact and duration of the distress. Post hoc, this would represent an error in forecasting as the experience was not as challenging as anticipated, when really it simply represents skillful coping.

The origin of this dissertation program came from a relative dearth of research examining self-compassion with respect to future decision-making. Previous work has highlighted the complexity of this interaction, with those displaying previous signs of problem gambling taking

increased risk if they are higher in self-compassion (Bailis et al., 2023). People often overestimate the distress they will experience in a scenario and underestimate their ability to cope. For individuals who already have a history of negative experiences with gambling, greater self-compassion and improved coping may have taught them that the emotional experience of a loss is not as distressing as they would have initially anticipated – similar to CBT treatment for anxiety where exposure to imagined scenarios allows people to test their faulty expectations. It may not be enough to simply say that greater self-compassion increases a person's perceived ability to cope and therefore increases risk-taking, but perhaps that if a person has already experienced a similar situation, self-compassion may have helped them tolerate the distress more successfully and taught them they are capable of handling a similar situation in the future, removing a disincentive for risk-taking.

In the context of the present research, this would highlight why it may be important to distinguish between athletes who have previously experienced an injury and those who have not. Those who are experiencing an injury for the first time may still be anticipating a greater degree and longer duration of distress. They have not yet had the opportunity to experiment with practicing self-compassion in this context, so don't know yet how it may improve the situation. Those who have already been injured, on the other hand, and are more self-compassionate, may have already seen the benefits, experienced a successful exposure, and gained first-hand evidence that they can withstand the situation if it were to happen again. While self-compassion may not impact risk-taking in the first return-to-play decision, it may have a larger impact on the second or third. In a similar vein, a person's decisional plan can obviously change over time. If an athlete were asked the day after an injury occurred, they may say that they will follow the doctor's orders exactly and adopt a very risk-averse approach. Six or nine months later, having

experienced distress, practiced self-compassion, and gained lots of evidence that they are capable of handling setbacks if they occur, their perspective may shift. The impact of self-compassion on future risk-taking is clearly still far from comprehensively understood and should be a fruitful area of research for the foreseeable future.

Forecasting emotion may be a useful skill to develop, though it's also helpful to consider the forecasting of behaviour. After all, anticipating one's emotional experience in response to a challenging event will mostly be used to guide implementation of coping strategies and decision making. Unfortunately, people are notoriously inaccurate in their predictions of their own behaviours. In most cases, people tend to be overly optimistic (Armor & Taylor, 1998; Dunning, 2007). This may be because people tend to focus on how they imagine they will behave rather than basing their predictions on relevant past experiences (Buehler et al., 2010; Dunning, 2007; Epley & Dunning, 2000; Kahneman & Lovallo, 1993). These imagined scenarios can be flawed, however, as they are often idealized and oversimplified versions of the scenario that only reflect a subset of the relevant information (Dunning, 2007; Krizan & Windschitl, 2007; Kunda, 1990). Plenty of research utilizing the theory of planned behaviour (Ajzen, 1991) has shown that a person's intentions to behave in a particular way are important as the stronger their intention the more likely they will be to carry out the behaviour. Intentions are important but far from foolproof, however, as a significant amount of variance in behaviour cannot be explained by intentions (Armitage & Conner, 2001; Rhodes & Dickau, 2012; Sutton, 1998; Webb & Sheeran, 2006). Instead, situational factors present barriers to engaging in the planned behaviour, which people do not accurately consider when moderating their intentions (Poon et al., 2014). In the present research, participants were asked to predict what they would do if they suffered an injury. Their actual follow-through on those behaviours, however, was not measured. It is

possible that participants may be overestimating the likelihood they will adopt certain strategies if they see those as beneficial.