Exploring the Stability of Self-Compassion, Self-Criticism, and Grit in Professional Triathletes Within Training

A Thesis Submitted to the College of Graduate and Postdoctoral Studies in Partial Fulfillment of the Requirements for the Degree of Master of Science in the College of Kinesiology University of Saskatchewan

Saskatoon

By

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Abstract

Professional triathletes need to navigate a fine line of training for three sports along with the mental and physical challenges of trying to meet standards of performance in order to be successful. The purpose of my research was to observe, through an exploratory through a single case design (SCD) study, whether self-criticism, self-compassion, and grit fluctuate for professional triathletes over a 3-week training period in which they are trying to achieve performance standards. Two professional long distance triathletes completed pre- and post-test measures of self-compassion, along with daily reports of these same measures. A visual analysis of daily measures was performed, revealing a general lack of stability in the variables examined both within and across participants. While one of the two athletes did not meet standards on two consecutive days as a naturally occurring intervention point, differences in stability before and after not meeting standards were challenging to interpret and demonstrate the complexity in athletes’ experiences related to trying to achieve performance standards. It remains for future research to determine whether the daily fluctuations I observed are representative of “true” daily changes in the constructs themselves or a result of measurement error associated with using single-time measures (or a combination of both).
Acknowledgements

I would like to thank my advisor Dr. Kent Kowalski for his patience and perseverance in helping me complete my thesis throughout the pandemic, education changes and many road blocks along the way. Additionally, I would like to thank my friend Kelly Corrine (KC) Hall for her support and guidance when first starting into the research field. Additionally, I would like thank my participants for their time and commitment in making my research a reality.
Dedication

I would like to dedicate this to my Mom, who has always shown through her actions, what hard work really means. As well, for her dedication to education and showing me that we should never stop learning.
### Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes

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Chapter 1. Statement of the Problem

In a world of high-level sport, where the difference between wins and losses is becoming smaller and smaller, athletes and coaches alike are looking for ways to get an edge on their competition. The addition of psychological skills training (PST) into practice and performance is increasingly considered a part of that edge (Birrer & Morgan, 2010). The pursuit of excellence and optimal performance in competition are seen as the biggest reasons why athletes seek out sport psychology and mental skills support (Rothlin et al., 2016). PST is not specific to one avenue of sport, and improvements are seen accordingly across domains ranging from swimming (Sheard & Golby, 2011) to short track speed skating (Beauchamp et al., 2012). However, in order to properly support an athlete and enhance their performance, PST experts must know what demands an athlete is facing, and, ideally, have their PST work sport-specific and individualized.

Endurance sports require a specific set of skills that differ from team sports or shorter-duration sports. For example, endurance athletes often attribute a great deal of their success to how well they are able to manage and tolerate high levels of athletic pain; athletic pain being the psychological and physiological pain associated with athletics and sport (Whitmarsh & Alderman, 1993). When looking at endurance sports as its own domain, triathlon is an endurance sport unlike any other. Specifically, it is both an endurance sport and a three-sport multisport and, as such, triathletes require specific resources in order to be successful within their chosen sport. Triathlon is “not a safe leisurely activity to promote good health, rather it is a test of human endurance which pushes the mind and body to dangerous extremes and exhaustion” (Zone of Excellence, 2004, p. 87). Not only must triathletes manage the psychological and physical stresses of training, they need to be able to manage the extreme time commitments
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(often 10-25 hours/week) that training imposes on their lives (Zone of Excellence, 2004). Therefore, when considering sport, and more specifically endurance sport and triathlon, there is a need for specific resources to help guide PST work with athletes based on the unique challenges and demands that they face. Thus, an important first step is to better understand how key psychological variables are impacted as triathletes face those challenges and demands in their training.

1.1. Introduction

“‘You can keep going and your legs might hurt for a week or you can quit and your mind will hurt for a lifetime’” (Mark Allen- 6x Ironman World Champion, as cited in Valenti, M, n.d.).

Triathlon has emerged in the last number of years as an ever-growing sport that involves a great deal of commitment of both time and effort (Extebarria et al., 2019). In fact, it was the rapid growth of triathlon, since its modern debut in the United States in 1970 as a mass participation event, that resulted in the inaugural involvement of triathlon in the 2000 Olympic Games in Sydney (Jiwani, 2020). Triathlon involves three individual sports combined sequentially into one endurance event: swimming, cycling, and running. Through appropriate training multiple physiological adaptations are achieved across various systems in the body, such as aerobic capacity and movement economy. These adaptations allow an individual to maintain high levels of energy expenditure for extended periods of time, and it is this optimal maintenance of energy output that leads to success in endurance events like triathlon (O’Toole & Douglas, 1995).
The term triathlon simply refers to a competition involving subsequent swim-bike-run events, but a vast degree of variation in distance and technicality can characterize different events (Extebarria et al., 2019). Broadly speaking, triathlon is split into two separate categories of “short” and “long” distance events. Sprint distance triathlon, which is one of the shortest events raced at an elite level. It is comprised of a 750 m swim, 20 km bike, and 5 km run. Standard or Olympic distance triathlon is the second of the “short” distance triathlon events and involves a 1.5 km swim, 40 km cycle, and 10 km run. In the “long” distance triathlon category, the most popular and well-known events are divided into ironman and half-ironman (also known as 70.3 events). An ironman triathlon event is comprised of a 3.8 km swim, a 180 km bike, and a marathon, which is a 42.2 km run. A half-ironman as the name implies, is half of that distance—a 1.9 km swim, 90 km bike, and half-marathon, or 21.1 km run (triathloncanada.com/athletes-teams).

1.2. Levels of Competition

There are various levels of competition within both short and long distance triathlon, and they are split into elite or professional, and age group divisions. Elite or professional triathlon is not marked by any age criteria, but rather by a set of performance standards set by a country’s governing triathlon body (e.g., Triathlon Canada). Age group triathletes compete in 5-year age categories at most regional and national events as well as at world championship-level races, but they are not racing against any elite or professional competitors. In short distance racing, elite athletes can draft in the bike, essentially creating a sheltered position on the bike when riding in packs of athletes, which leads to much more strategic race plans than in non-drafting events (triathlon.org, 2015). This means that age group and professional athletes in all long distance
races are required to complete the bike in a time-trial manner; that is, individually and without the aid of anyone else (Bentley et al., 2002).

Given the need to train for three separate sports, triathletes often “walk a so-called ‘knife’s edge’” (Bales & Bales, 2012, p. 214) in a sport that requires athletes to continually exist on the tipping point of injury, especially athletes competing at the professional level. Due to the challenge of navigating three sports, many triathletes need to manage a higher overall training volume and/or intensity compared to single-sport athletes (Bales & Bales, 2012). Bales and Bales (2012) looked at the situational effects that triathletes face as they constantly navigate a balancing act in order to maintain their optimal levels of fitness in all three sports (Bales & Bales, 2012). Additionally, triathletes navigate this balancing act while being continually conscious of risking an overuse injury that could lead to the inability to train and/or race (Extebarria, 2019). In many cases, athletes experience an injury in at least one of their three sports during a season, and may need to shift and focus on the remaining two in order to maintain fitness while simultaneously rehabilitating an injury (Bales & Bales, 2012). A large part of triathlon training is becoming accustomed to performing different sports within each training day as multiple sessions, or even within a single session performing multiple sports back-to-back. However, on a majority of days, professional triathletes will perform multiple sessions within a day in order to maximize the number of sessions in each discipline (Bales & Bales, 2012).

This ‘knife’s edge’ that so many triathletes navigate is exacerbated by the fact that there are three sports to train for and improve upon, and standards that must be met in each of those
sports. In order to compete in the professional/elite category of long distance triathlon as a Canadian triathlete, Triathlon Canada’s (2017) standards were set as follows:

“Athletes must achieve one of the following in at least one (1) race in the year they are seeking qualification.

1. Canadian Champion Overall (Professional and Age-group) or within 1% of the 1st place finishers time.

2. Qualify to compete in the professional category of IRONMAN (Hawaii) and/or IRONMAN 70.3 World Championships (first round Kona Points Ranking and Point Ranking 70.3).

3. Qualify with the following criteria in races with a prize purse over $10,000 CDN:

<table>
<thead>
<tr>
<th>Category</th>
<th>North American or International Race/ Total Event Prize Money</th>
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<tr>
<td></td>
<td>$10,000-$24,999</td>
</tr>
<tr>
<td>Women Professional</td>
<td>6% of the overall winner’s time</td>
</tr>
<tr>
<td>Men Professional</td>
<td>6% of the overall winner’s time</td>
</tr>
</tbody>
</table>

(Triathlon Canada, 2017)

These types of standards that athletes need to meet in order to compete at this level require dedication and constant mental and physical work, and every country dictates their own standards for what criteria must be met in order to receive professional/elite status. For example, Triathlon Australia has similar criteria to Triathlon Canada, in that an athlete who has not
competed in professional racing before must qualify by achieving a race finish time within 10% of the elite winner’s time, or one of a few other race options, and then submit an application to Triathlon Australia to be reviewed (triathlon.org.au). Triathlon New Zealand (triathlon.kiwi), United States of America Triathlon (www.teamusa.org/usa-triathlon), Triathlon Australia, and Triathlon Canada all have similar selection policies for athletes to qualify to compete as elite/professional triathletes.

One challenge of having performance standards that must be met in order to compete is that it sets the potential for high performance sport to be an extremely evaluative domain. An possible consequence is that athletes faced with trying to meet these standards set by governing bodies face a tipping point over that knife’s edge at which injury may occur (Bales & Bales, 2012). Injury is a setback that athletes experience in most sports and is often met with frustration and often viewed by athletes as having the potential to delay progression, completely stall progress or cause a decline (Mosewich et al., 2014). At times, when faced with the potential decline in performance, some professional/elite athletes have resorted to racing on minor injuries over an entire race season in order to fulfill sponsorship obligations (Bales & Bales, 2012). While athletes need not focus on outcomes in order to be successful, performance and hitting standards is often what they are evaluated on, especially when sponsorships and funding are on the line. Sponsorships for athletes are often very difficult to acquire and are sought by athletes in far greater numbers than the number of potential sponsors can carry (McCarville & Copeland, 1994). For a variety of reasons, elite categorization and sponsorship among them, triathletes need to perform. In order to perform, they need to be able to withstand intensive demands and standards of training in order to be successful during competition (Lemyre et al., 2008).
1.3. Training Standards

Within the training setting athletes have performance standards that are set before workouts and serve as guidance towards athletes’ performance standards and goals for races. “The primary aim of training is to prepare the triathlete for high-level competition” and, as such, the standards in training serve as the same standards that athletes aim for in competition (Extebarria et al., 2019, p. 2). Examples of these performance standards include pace times (e.g., time per 100m in swimming, time per kilometer or mile in running), specific Watts for power outputs on the bike, or specific heart rate zones for biking and running (Extebarria et al., 2019). Performance standards of athletes at this elite calibre can range from 1:15/100m in swimming, 4:10/km in running to a Functional power Threshold (FTP) of 250 Watts and higher on a bike. Additionally, the use of heart rate zones for performance standards include targets such as Zone 1- 50-60% of Heart Rate Max, Zone 2- 60-70%, Zone 3- 70-80%, Zone 4- 80-90%, Zone 5- 100%.

These standards and training parameters are specific to the type of adaptations and training needed to excel in the sport of triathlon. As an endurance sport, triathlon relies heavily on the aerobic system in order to fuel working muscles with sufficient oxygen to swim, bike, and run long distances. In order to accomplish this, the heart, lungs, blood, and muscle chemistry need to be trained to do this, and that training can be achieved through training at low efforts using slow paces, low heart rates, or low power outputs (Friel, 2010). Often in training, coaches will have their athletes perform test sets in each of the three sports in order to establish heart rate zones, swim pace times, run paces, and bike power zones. These are often in the form of a time trial for a certain distance or for a certain amount of time to see how far the athlete can go within that time limit. Based on these maximal efforts, coaches can use that information to
mathematically determine what heart-rates, pace times, and power levels, as examples, the athlete needs to be training at when in those ‘low and slow’ zones (Friel, 2010).

Athletes are seen as performing in a session when they are able to hit within a specific range of the target performance standards. However, these targets are often not easy to achieve, due to relentless standards and the constant pursuit of excellence. The narrowing line between wins and losses and the increasing density of high performing athletes creates an environment where it is necessary to continually improve in order to remain in this competitive field (Birrer & Morgan, 2010). Therefore, athletes who achieve success in the world of elite level sport are often characterized by a “single-minded determination that helps [athletes] persevere through the most demanding workouts and survive harsh training conditions” (Lemyre et al., 2008, p. 221).

1.4. Psychological Demands of Triathlon

A challenge athletes often face is not meeting the high standards of performance that they have set for themselves or have been set by external sources, which can be extremely difficult for them to cope with. The impact of these types of standards is evident in the narrative that professional/elite athletes must relentlessly pursue sport above all else in their life, and make the choice to put other aspects on hold in order to succeed (Aquilina, 2013). As well, Mosewich and colleagues found that high performance athletes felt pressure to perform from both internal expectations as well as external sources, and that poor performances would lead to feelings of frustration (Mosewich et al., 2014).

In my research I focussed on the psychological variables of self-criticism, self-compassion, and grit. Self-criticism is often present when regulating to high standards and goals
(Lemyre et al., 2008), and may in fact hinder goal pursuit (Powers et al., 2011). Self-compassion offers an alternative to harsh self-criticism and can be a powerful motivator for someone to push through difficult times and challenges, to learn from mistakes, and to persevere, largely because of the desire to be content with ourselves and live free of suffering (Neff, 2011). In addition, self-compassionate individuals have been shown to aim just as high as their more critical counterparts, but are not as devastated by the inevitable failures that come with high expectations (Neff, 2011). Just as the self-compassionate individual approaches challenges and difficult times adaptively, Duckworth et al., (2007) have shown that these same features of persevering despite failures, disappointments, or adversity are what define the gritty individual (Duckworth et al., 2007). Grit is a long-term skill that combines consistency, passion, and perseverance that may provide benefit to athletes beyond self-compassion, especially when they face challenges related to not meeting training standards. Each of these variables are discussed more in the sections that follow.

1.5. **Self-Criticism**

At any level of sport, setbacks like failing to meet standards and poor performances are inevitable and can be the basis of many negative repercussions, such as self-criticism and stress. The added pressures that professional/elite athletes are under can exacerbate these repercussions (Mosewich et al., 2014). Self-criticism is often experienced in the context of goals or standards, and more specifically when individuals fail to meet them. There is often the mentality that athletes are striving for perfection in their performances, and that anything less is a failure to meet standards and results in self-critical thoughts (Lemyre et al., 2008). Importantly, self-
criticism may in fact hinder goal pursuit and lead individuals to be more concerned with
avoiding failure than achieving goals (Powers et al., 2011).

Although continuing to improve and better oneself is a positive goal to strive for, when
there is an unhealthy tie between self-worth and athletic performance, this relentless pursuit of
excellence can be detrimental and lead to many difficult psychological experiences, such as
increasingly negative affect and maladaptive thinking when performance standards are not met
(Lemyre et al., 2008, Reis et al., 2015). With both adaptive and maladaptive ways to confront
setbacks and the pursuit of excellence, it is when the maladaptive thinking takes over that
athletes run into troubling territory, often in the form of harsh self-criticism. Killham et al.
(2018) showed that self-criticism is largely based in maladaptive thought patterns, and that there
is potential impact of self-criticism on an athlete’s sport performance and that it can contribute to
sport burnout. Self-criticism can be thought of in many different facets, but it often also involves
feelings of inadequacy, self-hatred, and harsh self-scrutiny (Duarte & Pinto-Gouveia, 2017;
Killham et al. 2018). Therefore, in order to address these potential barriers to success and
optimal performance, athletes and coaches need effective coping tools, such as self-compassion.

1.6. Self-Compassion

Self-compassion has been negatively associated with self-criticism in sport specific
contexts (Killham et al., 2018) and is defined by Neff (2003a) has having three basic
components: (a) kindness to oneself as opposed to harsh self-criticism (i.e., self-kindness), (b)
observing one’s own experiences as part of the larger human experience (i.e., common
humanity), and (c) mindfully balancing thoughts and feelings instead of suppressing or denying
them (i.e., mindfulness). Self-compassion is associated with a balanced perspective that enables
athletes to learn from mistakes and persist towards long-term goals in sport (Killham et al., 2018). In research specifically with women athletes, Killham et al. (2018) explored the relationship between self-compassion, self-criticism, and perceived sport performance and found that “self-compassion was negatively correlated with self-criticism and positively correlated with perceived sport performance” (Killham et al., 2018, p. 302).

Mosewich et al. (2013) used a self-compassion intervention with a group of varsity women athletes and found that there were significant increases in self-compassion levels, and also decreases in self-criticism from initial testing to post-testing after the intervention. This further validated the use of self-compassion as a practical and useful tool for athletes to in both practice and competition. In their 2015 work, Reis et al. (2015?) found that women athletes with higher levels of self-compassion were generally able to respond to emotionally difficult situations, both recalled and hypothetical, in healthier ways compared to peers who did not exhibit the same levels of self-compassion. Ferguson et al. (2015) found similar results to Reis et al. (2015) in that higher levels of self-compassion were found to have a significant relationship with psychological well-being in sport, as well as healthier reactions to emotionally difficult situations in sport. To our knowledge, previous research has not yet addressed how self-compassion and self-criticism interact specifically in the context of triathletes’ attempts to meet performance standards in training.

1.7. Relation of Grit and Self-Compassion

According to Duckworth, “Grit is sticking with your future day in, day out. Not just for the week, not just for the month, but for the years. And working really hard to make that future a reality. Grit is living life like it’s a marathon, not a sprint” (Duckworth--TED, 2013, 3:06).
Studies of high performance in the field of academia have shown that grit is a variable that is highly predictive of success measures when the goal demands talent along with continued and focused dedication of work over time (Duckworth et al., 2007). Grit is defined as “perseverance and passion for long-term goals” (Duckworth et al., 2007, p. 1087). It is defined on the basis of continuous hard work and investment towards one’s goal despite being faced with failure, challenges, and plateaus in progress (Duckworth et al. 2007). Grit is theorised as being composed of (a) consistency of interest and (b) perseverance of effort. When an individual demonstrates prolonged commitment and focus towards a goal or task, this is regarded as consistency of interest. Perseverance of effort is seen in an individual’s effort levels, and their consistency of effort regardless of roadblocks and failures has been studied in the context of sport (e.g., Cormier et al., 2019). Grit is a global concept that is applied to many different domains, and is associated with “a multitude of affective, cognitive, and achievement/performance correlates in a range of achievement, social, and vocational-settings including academe, competitive sport, marital relations, military selection/training, teaching, and business/entrepreneurship” (Cormier et al., p. 349, 2019).

1.8. Purpose

The purpose of my research was to observe through an exploratory study, using a single case design (SCD), whether self-criticism, self-compassion, and grit fluctuate for professional triathletes over a 3-week training period where they are trying to achieve performance standards. A secondary purpose was to see whether athletes do have periods where they do not meet these demands. Thirdly, if there were periods where athletes did not meet standards over 2 consecutive sessions, then were there subsequent fluctuations in the stability of self-criticism, self-
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compassion and grit following training those sessions in which performance standards are not met. In more general terms, my research was intended to provide insight into the stability of certain psychological skills that might make recovery from failure to achieve performance standards either easier or more difficult. An applied downstream goal was to inform implementation of psychological skills training related to self-criticism, self-compassion, and grit into triathlete training programs in order to maximize training and performance potential.
Chapter 2. Methods

2.1. Research Design

The methodology used was a single case design (SCD) with a multiple baseline approach. Individual “cases” (Kratochwill et al., 2010) in an SCD may be a single participant or a cluster of participants (e.g., a community, such as professional triathletes). Generally classified as an experimental design, SCD has a central goal of determining whether causal relationships exist and are typically used when there is a researcher-manipulated (independent variable) intervention (Kratochwill et al., 2010). One of the benefits of SCD is that researchers are able to look at individual trends in behaviour and observe potential causal relationships (Kratochwill et al., 2010), which is why I have chosen this design for my study, specifically with an organically fluctuating intervention defined by variations of success in meeting training standards.

Conventionally, most interventions in sport psychology are administered and analyzed at a group level rather than an individual one. This puts a larger and broader focus on a study and can be problematic in terms of missing individual trends and behaviours. These individual trends and behaviours are extremely important when it comes to assessing individual athletes within an applied setting (Westlund Stewart & Hall, 2017). There are two studies that provide strong insight into the use of SCD, Westlund Stewart and Hall (2017) and Callow et al. (2001). Westland Stewart and Hall (2017) used a SCD, single-subject multiple baseline approach in order to look at the effects of a general imagery-training package on curling performance. The research design chosen allowed for results to be conclusive of the imagery training intervention.
as a strategy for improving curling performance with a sample size of three participants (Westlund Stewart & Hall, 2017).

Callow et al. (2001) in a similar study, looked at a motivational general-mastery imagery intervention on the sport confidence of high-level badminton players, and utilized a multiple-baseline across each of the four participants. The basis of the choice to utilize multiple-baseline single subject design were described as follows: “(a) large sample sizes are not a necessity to draw statistical inferences; and (b) design complexity can be reduced. Furthermore, because single-subject design research can involve repeated observation or data collection over time, individual variability can be studied and the true effects of an intervention on a participant evaluated” (Callow et al., 2001, p. 390).

My study used the research of Westland Stewart and Hall (2017) in particular as a guiding framework for study design and methodology because of their focus on an elite athlete population, as well as their focus on sport psychology (i.e., mental skills). It was also helpful as a guiding framework because they used the approach proposed by Kratochwill et al. (2010). In my study, the independent variable was the organic fluctuation of the athlete’s performances within the training setting, and more specifically I looked for points where they did not meet performance standards. This non-meeting of standards fits well into an applied field approach as it is a real and regularly occurring event for athletes in training, and SCDs are especially appropriate for pursuing research questions within this area (Kratochwill et al., 2010). Despite the difference in my study (i.e., the use of an organically fluctuating independent variable versus an intervention), the use of SCD seemed to be an appropriate choice of study design given that many of the additional features that comprise SCD were present. These included: 1) repeated
measures across different conditions of an independent variable (Kratochwill et al., 2010) that is naturally going to change; and 2) the cases (or each participant) acting as their own control for comparison purposes across timepoints prior to, during, and after the study was completed (Kratochwill et al., 2010).

The variables of focus in my study (e.g., self-criticism, self-compassion, and grit) are applicable to applied sport psychology fields as they relate to potential for contribution towards elite athlete performance. Additionally, SCD is particularly relevant with groups that have a low number of individuals, that makes using a typical large group design difficult (Kratochwill et al., 2010). As a group, professional long distance triathletes are a small and niche cohort of individuals, and thus a strong fit for utilization of SCD. As a multiple baseline approach to SCD, this involved a staggered introduction of the independent variable, in this case the fluctuations in performance/under-performance, across multiple different time points (Kratochwill et al., 2010).

2.2. Participants

Participants were two professional long-distance triathletes (one male, one female; see Section 3.1.1 for more demographic information). Inclusion criteria for participants was (a) designation as a professional triathlete within the Triathlon Canada criteria (Triathlon Canada, 2020), (b) competing in half iron and full iron distance triathlon, and (c) having completed at least one full season in the professional category within the last five years. Additionally, (d) participants needed to be currently training, which may have included being injured and working on rehabilitation, an aspect of training still considered to be a structured training regime of a professional athlete. Athletes did not need to have a coach; however, the final inclusion criteria was that (e) a training plan with daily organization was a requirement. This training plan could
have been different for each athlete depending on what part of their race season they were in, if they were injured, building fitness, tapering, etc.; but a minimum of five training sessions per week was required to accumulate sufficient data. It is important to note, however, that neither athlete identified injury rehabilitation as a primary aspect of their training.

The initial participant was contacted via purposeful sampling (i.e., an athlete I knew previously from my social network), with the subsequent participant chosen via snowball sampling (i.e., identified by the first participant). All data was de-identified, and pseudonyms were used in any written documentation.

2.3. Measures

In addition to demographic information, quantitative data was collected by way of sport specific scales for athlete self-criticism, self-compassion, grit, self-efficacy, and performance.

2.3.1. Pre and Post-Test Measures

2.3.1.1. Demographics.

Information on athlete’s age, sex, ethnicity, height, weight (Killham et al., 2018), years of training in the sport, years of competition as a professional, and injury status were collected. Demographic information was only collected at the pre-test date. Please see Appendix A1.

2.3.1.2. Self-Criticism Full Scale.

Athlete self-criticism was assessed by a 7-item measure of an athlete version of a state self-criticism (SC-AV; Mosewich et al., 2013). It measured an athlete’s self-critical thoughts and emotions and ranged from 1 to 10 on how intrusive a recent negative event was deemed (with 1 being “not at all” and 10 being “very intrusive”). It was adapted from a scale developed by Gilbert and Proctor (2006) and originally created as a self-monitoring log (Killham et al., 2018).
Gilbert and Proctor (2006) had two different self-criticism scales that informed the scale used by Mosewich et al. (2013), which demonstrated good internal consistency reliability with values of $\alpha = .90$ and $\alpha = .86$ respectively. Please refer to Appendix A2.

2.3.1.3. **Self-Compassion Full Scale.**

Athlete self-compassion was assessed by a 26-item adapted athlete version of the Self-Compassion Scale (SCS-AV, Killham et al., 2018). This measure has been adapted from the original version created by Neff (2003b), which includes six subscales to represent the different elements of self-compassion. These subscales include self-kindness (five items), self-judgment (five items), mindfulness (four items), overidentification (four items), common humanity (four items), and isolation (four items) (Killham et al., 2018). A mean score of all 26-item measures was used for assessment after reverse coding negative items as was done by Killham et al. (2018). Higher scores indicate higher levels of self-compassion (Killham et al., 2018). Internal consistency values for the composite score of the original measure range from $\alpha = .73$ to $\alpha = .94$ (Killham et al., 2018). Please refer to Appendix A3.

2.3.1.4. **Grit Full Scale.**

Athlete grit was assessed by a sport specific version of a 12-item scale adapted from Duckworth et al.’s (2007) scale (Cormier et al., 2019). These 12 items compile the two parts that comprise grit, consistency of interests and perseverance of effort. In order to be relevant in a sport specific context rather than the initial global domain, all items in the sport scale are led by the phrase “As an athlete in sport…” (Cormier et al., 2019). Reliability of the Grit-Sport scale has been supported with research showing internal consistency values of $\alpha = .79-82$ (Cormier et al., 2019). Please refer to Appendix A4.
2.3.1.5. **Endurance Sport Self-Efficacy Full Scale.**

Self-efficacy was included as a variable that self-criticism, self-compassion, and grit could be compared against, and refers to beliefs about what an individual thinks they can do (Feltz & Lirgg, 2001). Given the fact that performance accomplishments have been proven in research to be the strongest influence on an individual’s self-efficacy (Bandura, 1999), it is appropriate that the stability of the remaining constructs in this study were considered within this context. Given the link between performance and self-efficacy, the latter was used as a comparator of either stability or fluctuation depending on how training sessions have gone. Self-efficacy can then be compared to the remaining variables that have unknown correlations to performance. Self-efficacy has also been looked at in an endurance sport-specific context, and it was found that self-efficacy was considered a stronger positive predictor of triathlon performance (specifically ironman distance triathlon) than past performances, maximal oxygen consumption, and confidence in sport (Anstiss et al. 2018). Athlete self-efficacy was assessed in an endurance sport specific domain through the 11-item Endurance Sport Self-Efficacy scale (Anstiss et al. 2018). Internal consistency of the scale was $\alpha = .88$. Please refer to Appendix A5.

2.3.2. **Daily Measures**

2.3.2.1. **Perceived Achievement of Performance Standards and Self-Efficacy**

According to Bandura (1997), in order for performance to be measured and assessed, there must be appropriate circumstances, little measurement error, and minimal ambiguity of task demands. Therefore, participants were asked for a brief description of the training session and standards to meet for the session chosen as the most challenging and with the most defined performance standards. It was up to the discretion of the athlete as to which session they felt met
criteria for offering the most challenging standards to meet. This was done prior to beginning the session. These standards were set by an athlete’s coach, trainer, or training plan (e.g., a run workout consisting of kilometer repetitions with a defined pace and rest period).

Along with this description, one question adapted from the Endurance Sport Self-Efficacy scale (Anstiss et al., 2018) was asked as the daily measures of self-efficacy. As self-efficacy is viewed as what an individual [athlete] believes they can achieve or perform (Feltz & Lirgg, 2001), the question chosen was specific to the physical performance being evaluated in this study. On a 100-point scale used by Anstiss et al. (2018) ranging from 1 “Cannot do at all” to 100 “Certain can do” participants were asked about their confidence in their abilities to achieve the performance standards they were trying to achieve in their training session.

Following training, Perceived Achievement of Performance Standards was assessed with a simple three question survey comprised of either “I did not meet training performance standards”, “I met training performance standards” or “I exceeded training performance standards”. The athlete was asked to select the one that was most applicable to the session they described and completed. Please refer to Appendix A6.

2.3.2.2. Short Measure for Self-Criticism and Self-Compassion

For the daily measurements of self-criticism and self-compassion, there were four questions used in studies by Reis et al. (2015) and Leary et al. (2007). On a 6-point scale ranging from 1 “not at all” to 6 “extremely”, participants were asked to rate their reactions to the following questions: “I tried to be kind to myself,” “I tried to make myself feel better,” “I kept the situation in perspective,” and “I was really hard on myself” (Leary et al., 2007). Though the chosen questions were not taken directly from either of the self-criticism or self-compassion full
scales, research by Reis et al. (2015) and Leary et al. (2007) using these questions reflects their use as strong indicators of the constructs of self-criticism and self-compassion, as well as the relationship between them (Reis et al., 2015). Directions and prompts on how to answer the questions were discussed with the lead author of the Reis et al. (2015) study in order to provide appropriate context for the participants in my study (e.g., Think about the most difficult part of your training today and respond to the following questions with that in mind. Keep in mind that the event you are recalling could have been quite bad or have been very minor) (N. Reis, personal communication, January 18, 2021). Please refer to Appendix A7.

2.3.2.3. Short Measure for Grit

The concept of grit is conceptualized by two components, including Consistency of Interests and Perseverance of Effort (Cormier et al., 2019). As such, the daily grit measure consisted of one question for each of these components. Questions were rated on a 7-point scale ranging from 1- “Not at all like me” to 7- “Exactly like me” and were chosen as the ones deemed most applicable to daily assessments, as grit is generally viewed as a long-term construct for perseverance over time (Duckworth et al., 2007). The wording of the two questions were chosen and adapted from the Cormier et al. (2019) scale because of their high pattern coefficients with the Grit in Sport Full Scale (.66 for consistency of interest and .71 for perseverance of effort respectively). The questions were as follows: “As an athlete in sport, I set a goal/standard before beginning my training session today but then later in the training session chose to pursue a different one” and “As an athlete in sport, today I overcame setbacks in my training session to meet an important goal/standard” (D. Cormier, personal communication, January 11, 2021; Cormier et al., 2019). Please refer to Appendix A8.
2.4. Procedure

Ethical approval was obtained from the University of Saskatchewan, and participants were informed of this approval and provided informed consent (Appendix A9). All data collection was done through virtual communication and e-mail with me. Prior to the initial start date of the study, participants completed a baseline assessment with full scale measures of self-criticism, self-compassion, grit, and self-efficacy, as well as demographics measures. These were completed approximately three days before the start the three-week daily data collection period. Subsequently, post-testing full-scale measures were administered within three days of the completion of the three-week period, a time-line similar to that used by Westlund Stewart and Hall (2017).

Participants were asked to complete five days of daily measurement questions for three weeks through e-mail correspondence with me, assessing self-compassion, self-criticism, grit, self-efficacy, and perceived achievement of performance standards using the adapted short-scale questionnaires. The daily measurements were broken down into two sections, one completed prior to training, and the second part to be completed after the training session was complete. The first portion of the “Perceived Achievement of Performance Objectives and Self-efficacy” scale labeled “pre-training” was completed prior to participants completing their training session, and the second portion labeled “post-training” was completed after the session, along with the “Short Measure for Self-Criticism and Self-Compassion” and the “Short Measure for Grit” scales. The data collection timing is outlined in Figure 2.1 where daily measures 1 through 5 are the days within each week that data was collected ie. Daily measure 1 being the first day that the daily measurements were collected that week.
The intervention phase that is generally a part of SCD (Kratochwill et al., 2010) was the organically occurring fluctuation in performance that led to meeting or not meeting performance standards for this study. With the Westlund, Stewart and Hall (2017) design, there was an imagery intervention implemented which provided definite phases of the study. However, with the organic intervention design of my study, the intent was to observe potential changes that occur in the psychological variables after a period of not meeting objectives in training. My study used the scenario of participants reporting two consecutive sessions of not meeting performance objectives as the natural intervention point, and subsequently used this as the basis to observe what potential trends ensue after that point. The rationale for choosing two consecutive sessions is that one single session of not meeting performance objectives could be
seen as a fluke, or a one-off if the athlete is able to meet standards again in the next session (especially when these athletes will often have multiple sessions in a day). Thus, having two sessions as the natural intervention point, allowed for a happy medium between reinforcement of not meeting performance standards, and regular occurrence of goal frustration as an intervention point.

2.5. Analysis

The method of visual analysis of graphical data is a consistently used method of data analysis with single-subject multiple baseline design studies (Kratochwill et al., 2010; Westlund Stewart & Hall, 2017). The visual analysis of data has been used to determine whether or not there is evidence of a relationship between variables (often the independent variables and the outcome variable) and how strong the relationship is (Kratochwill et al., 2010). Kratochwill et al. (2010) described six necessary features in order to properly assess data patterns. First is level, which is the mean score within a phase, such as baseline, post-test, etc. Second is trend, which refers to the slope of the line of best fit within a specific portion of the study (e.g., the intervention phase, baseline etc.). Third is variability which speaks to the variation of data around the mean of each phase. The fourth criteria is immediacy of effect, which refers to changes that occur between the means of different phases. Fifth, proportion of overlap simply means the amount of data points that overlap between phases. Finally, consistency of data patterns across similar phases involves looking at the same phase (e.g., the intervention phase or the initial baseline) between each of the participants and looking for consistencies within those same conditions. These same criteria were to be used in this study when conducting visual analyses (Westlund Stewart & Hall, 2017).
Chapter 3. Results

3.1. Sample Descriptive Statistics

The sample consisted of one male and one female professional triathlete. The average age was 30 years, and both participants identified their ethnicity as white. The average number of years competing in triathlon was 11, with the average number of years competing as a professional triathlete being 5.5. More specific information describing each participant in detail is not provided in order to help protect the confidentiality of the athletes.

3.2. Pre-test & Post-test (Full Scale) Measures

Averages of all full-scale measures from pre- and post-test results have been included for Participant A and B in Table 3.1. As shown in Table 3.1 all means increased from pre-test to post-test (although it should be noted that a test of significant difference is not appropriate given the sample size). Pre and post-test full scale measures were done within 3 days of beginning data collection and within 3 days of collection completion.
Table 3.1

Full scale measures (pre and post test) of all psychological variables (self-criticism, self-compassion, grit and self-efficacy)

<table>
<thead>
<tr>
<th>Full Scale Measures</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Criticism</td>
<td>3.43</td>
<td>5.43</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>3.08</td>
<td>3.27</td>
</tr>
<tr>
<td>Grit</td>
<td>3.50</td>
<td>3.67</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>59.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Participant B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Criticism</td>
<td>6.71</td>
<td>8.57</td>
</tr>
<tr>
<td>Self-Compassion</td>
<td>2.65</td>
<td>3.12</td>
</tr>
<tr>
<td>Grit</td>
<td>3.67</td>
<td>3.75</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>80.0</td>
<td>86.4</td>
</tr>
</tbody>
</table>

3.3. Daily Measures

Graphical data for daily measures of self-compassion, self-criticism, and grit for Participant A and B are presented in Figures 3.1 and 3.2. In Figures 3.1 and 3.2, the number of denoted lines for each variable coincides with the number of daily questions related to that specific psychological domain. There were two measures of grit, three for self-compassion, and one for self-criticism. The rationale for having the multiple questions for grit and self-compassion was to be able to encompass all the sub-domains within each variable. Self-compassion, (Self-Compassion 1 - light blue) is related to the sub-domain focused on “trying to be kind to themselves”, (Self-Compassion 2 - dark blue) on “trying to make themselves feel better” and (Self-Compassion 3-grey blue) on “keeping the situation in perspective”. Within the
domain of grit, the sub-domain of sticking to a goal of a session is shown in (Grit 1-orange) and that the sub-domain of overcoming setbacks is shown with (Grit 2-yellow).

Three weeks (5/7 days) of daily psychological variables were compared to achievement of, or not achieving training standards. Training parameters were met each day unless denoted in Figures 3.1 and 3.2 as “did not meet” (***) or “exceeded” (^^^). The red dotted bar denotes a time point at which there were 2+ consecutive days of not meeting training standards. Participant A had only one day of not meeting standard (Day 3), and hence did not meet the criteria required to have an organic intervention point. However, Participant B noted not meeting standards on Days 8, 9 and 10, which constituted an organic intervention point. Additionally, Participant B exceeded training standards on Day 15. It is important in these figures to observe all of the variables within a single graph in order to be able to see the variability of the psychological constructs in comparison to one another. The idea was to see if certain variables would change in opposition to each other or in similar directions. We have found, however, that for the most part, each construct is quite individual in its variability.
Figure 3.1

Graphical data for all daily measures (Participant A)
Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes

Figure 3.2

*Graphical data for all daily measures (Participant B)*
3.3.1. Self-efficacy

The means across all daily measures of self-efficacy were 88.1 (SD = 20.1) for Participant A and 84.7 (SD = 18.1) for Participant B (see Figures 3.3 and 3.4). There are fluctuations in self-efficacy that are seemingly independent of whether training standards were met or not met. Additionally, the fluctuations in self-efficacy for both participants appear quite variable with a large SD, but an overall high mean value. Self-efficacy was intended to be used as the barometer to measure other variables against within this study because of the literature identifying it as a stable and solid indication of an athlete’s perspective of their abilities within sport.

Figure 3.3

Graphical data for daily self-efficacy measures (Participant A)
3.3.2. **Self-compassion**

The means across all daily measures of self-compassion for Participant A were as follows: Series 1 Mean = 4.56, SD = 0.73; Series 2 Mean = 4.13, SD = 0.96; Series 3 Mean = 4.88, SD = 0.34. For participant B we see the following self-compassion results: Series 1 Mean = 3.33, SD = 1.50; Series 2 Mean = 1.93, SD = 1.93; Series 3 Mean = 5.47, SD = 0.64 (see Figures 3.5 and 3.6). Generally, Participant A tended to have higher levels of self-compassion than reported by Participant B over the data collection period, as well as lower SDs. Both participants had lower overall levels for the self-compassion scales of trying to be kind to themselves and trying to make themselves feel better in relation to not meeting, meeting, or exceeding daily performance standards (i.e., Series 1 and Series 2). Overall, both participants
reported high mean values for the self-compassion scale item focused on keeping the situation in perspective (i.e., Series 3). For Participant B, mean values for the period prior to not meeting standards on consecutive days (i.e., the 9 days preceding the organic intervention point) were as follows: Series 1 Mean = 3.56, SD =1.24; Series 2 Mean = 1.78, SD =1.20; Series 3 Mean = 5.56, SD =0.53. For the 6 days following the organic intervention the Mean and SD for Participant B were as follows; Series 1 Mean = 3.00, SD =1.90; Series 2 Mean = 2.17, SD =1.83; Series 3 Mean = 5.33, SD =0.82.

**Figure 3.5**

*Graphical data for daily self-compassion measures (Participant A)*
Figure 3.6

Graphical data for daily self-compassion measures (Participant B)

Self-Compassion (Participant B)

Series 1- “Trying to be kind to themselves”  Series 2- “Trying to make themselves feel better”  Series 3- “Keeping the situation in perspective”

Daily Training Standards
3.3.3. **Self-criticism**

The means across all daily measures of self-criticism were as follows: 2.06, SD = 1.34 for Participant A and 3.80, SD = 1.33 for Participant B (see Figures 3.7 and 3.8). Notable is that Participant A displayed a slightly lower mean (2.06) compared to Participant B (2.27), but that the SD values (i.e., 1.34 and 1.33) are similar between participants. When comparing self-criticism and self-compassion, Participant A appears to have slightly lower levels of self-criticism and generally higher overall means for self-compassion in each of the domains aside from self-compassion Series 3 (keeping the situation in perspective) compared to Participant B. Participant B experienced the organic intervention point and we see the following: Self-criticism Mean = 1.89, SD = 1.17 for the 9 days preceding the organic intervention, and Mean = 2.83, SD = 1.47 for the 6 days following it.
Figure 3.7

*Graphical data for daily self-criticism measures (Participant A)*
Figure 3.8

Graphical data for daily self-criticism measures (Participant B)
3.3.4. **Grit**

The means across all daily measures of grit for Participant A were as follows: Series 1 Mean = 2.0, SD = 1.71; Series 2 Mean = 4.13, SD = 1.71. For participant B, measures of Grit were as follows: Series 1 Mean = 1.67, SD = 1.63; Series 2 Mean = 2.87, SD = 1.96 (see Figures 3.9 and 3.10). Within the domain of grit, we see that the sub-domain of sticking to a goal for a session (i.e., Series 1) was fairly consistent throughout, with some minor fluctuations. For Participant B, however, the sub-domain of overcoming setbacks (i.e., Series 2) appears more variable through visual analysis. Participant B experienced the organic intervention point and we see the following for the 9 days preceding the organic intervention: Series 1 Mean = 1.67, SD = 2.0; Series 2 Mean = 2.89, SD = 1.96. For the 6 days following the organic intervention point: Series 1 Mean = 1.67, SD = 1.03; Series 2 Mean = 2.83, SD = 2.14.
Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes

Figure 3.9

Graphical data for daily grit measures (Participant A)

Figure 3.10

Graphical data for daily grit measures (Participant B)
Chapter 4. Discussion

4.1. Discussion

The purpose of this study was to explore whether self-criticism, self-compassion, and grit fluctuate for professional triathletes over a 3-week training period where they are trying to achieve performance standards. Further, my goal was to identify possible fluctuations in psychological variables that have previously typically been looked at using longer duration measurements. Accordingly, we employed measurements on a daily basis to capture the state fluctuations of these variables. I found that many of these variables, often thought of as stable over longer periods of time, have a noteworthy amount of daily and weekly fluctuation. Furthermore, these fluctuations are seen not only between variables but also within the domains of the variables themselves.

Taking a daily measures approach to study fluctuations in variables appeared to be particularly valuable. A key reason is because a daily measures approach highlighted differences across time within each of the variables and their sub-domains. It also allowed for the sub-domains to be distinguished from the higher-order variable in a way not typically done when data collection is captured over longer time periods and with less frequent assessments. For example, Killham et al. (2018) studied self-compassion over two time points of data collection that were “scheduled within 1 to 5 days of [a] scheduled competition (typically 2 to 3 days pre/postcompetition)” (p. 300). Another reason why fluctuations in variables were apparent was likely because the single case design approach I used is intended for an individual level of analysis. Said another way, such individual aspects of fluctuation might be missed in a group-level of analysis. Placing the focus on group level studies and analysis leaves gaps and potential
omissions “because individual trends and behavior can be missed, which are important when assessing individual athletes in applied sport settings” (Westlund Stewart & Hall, 2017, p.120). Especially when looking at individual sports, this type of study design and analysis could represent a salient tool for individual assessment and directed training programs. As noted previously, the single case design is likely to exhibit a higher levels of fluctuation and pertinence because it does not focus on the group level, but rather on the individual trends of each participant (Westlund Stewart & Hall, 2017).

However, although fluctuations in variables may represent “true” changes across time, it is also possible that the lack of stability in daily measures was due to measurement error associated with single-item measures. Generally self-compassion, self-criticism, and grit are assessed with multiple-item questionnaires, such as the 26-item SCS (Neff, 2003b). Shortening the length of measurement from validated scales and questionnaires to single items may increase the possibility of measurement error. For example, internal consistency is often used as a method of determining the reliability of a measure, but it is influenced by the number of items within a scale and how they relate to one another (Horvath & Rothlin, 2018; Schweizer et al., 2020). The related challenge is that, when the number of questions used to assess a variable is shortened from the normal number, it may not accurately encompass the full domain of the variable under study. Because of this, we may see a fluctuation representative of only a sub-domain rather then the construct as a whole. Perhaps it is not possible to adequately assess these constructs using daily single-item measures. This contention may be one reason that, within the “complex…dynamic, multifaceted and contextual nature” (Mosewich et al. 2014, p. 185) of
sport, there is an increase in qualitative interview style research to elucidate the psychological variables and coping skills that influence an athlete’s psychological state.

Regardless of the reason for fluctuations, there seemed to be differences in the level of stability and fluctuation across the different variables. While we can see significant amounts of daily fluctuations across variables, self-compassion seems to demonstrate somewhat less fluctuation across time than self-criticism and grit. Self-compassion has been shown to be a stable entity when athletes are given the tools to cultivate it (Mosewich et al., 2013). However, we do see variation in stability across the sub-domains of self-compassion. Beyond this, we are able to see visual differences in stability across self criticism, self compassion and grit variables, with self-criticism seeming to be the least stable of the three. The instability of self-criticism seems to be prominent regardless of whether the athlete has met or not met their performance standards of that day. Fluctuations in grit might be a bit surprising, given that research has shown that grit is a fairly stable and consistent variable within an individual. However, stability is in and of itself a key component of grit, being comprised of consistency of interest, perseverance of effort, and “maintaining effort and interest over years despite failure, adversity and plateaus in progress” (Duckworth et al., 2007, p. 1087).

In addition, any conclusions related to the meeting or not meeting of standards needs to be interpreted with caution as only one participant reported two consecutive days of not meeting performance objectives, which was chosen as the organic intervention point. There may be many reasons that the athletes were able to meet performance standards more often than not in training. For example, during a base season of training, standards may be more focussed on simply getting the mileage in, and so as long as the athlete completes the workout they have essentially ‘met
standards’ for that workout (i.e., they might not have even needed to achieve a specific pace
time). Alternatively, some coaches rely more heavily on training sessions that are designed for
the athlete to fail (i.e., not meet standards) as a form of testing the athlete’s limits. However, this
type of training where athletes go until physical failure may not be beneficial for other athletes,
which is why requirements for volume, intensity, etc. are extremely individualized (Extebarria et
al., 2019). Additionally, different periods within the season will allow for different goals within
training. For instance, during base season, the aim is often simply to build mileage and the paces
are generally not overly challenging for the athlete to meet. These differences in training
intensity within and between sessions are extremely important when trying to avoid injury and
peak for specific times of the year (Extebarria et al., 2019).

Athletes are continually trying to balance pushing their bodies for the best training
adaptations while trying to avoid negative outcomes, such as illness, injuries, overall poor well-
being and mental burnout. Thus, although trying to achieve high training standards can be
important, training sessions may also at times be designed to increase an athlete’s mental well-
being and thus have more “attainable” standards (Extebarria et al., 2019). Even for Participant B
who experienced not meeting training standards on consecutive days, there does not seem to be a
large difference between the days preceding versus following the organic intervention. In fact,
when looking at the variability within measures for both participants, the peaks and troughs seem
to be relatively independent of whether or not training standards were met or not (i.e., there does
not seem to be a strong increase or decrease in stability before or after not meeting standards).
Interestingly we can see that for Participant B, there is a spike in grit and self-compassion on the
days of not meeting standard (Days 8, 9, 10), and that on the day where Participant B exceeded
performance goals, the levels of grit seemed to be lower compared to the days of not meeting standard. The numerous reasons for participants meeting standards for the majority of sessions within the data collection period reiterate the fact that interpretation of fluctuation of variables and their interactions requires caution. This is highlight by the fact that self-efficacy, included as a standard of comparison seemed to also demonstrate fluctuations throughout the period of observation.

Although it is hard to make any firm conclusions based on the findings of my research, a strength of my research was the use of a single-case study design. The single-case design allowed me to collect data on a frequent (i.e., daily) basis and allowed for consistent tracking and an opportunity to observe any potential changes that might occur quite rapidly (i.e., day-to-day). Not only is the frequency of data collection a strength of this type of data collection, but it also gives an abundance of data for even a small number of participants. When the population of interest (e.g., professional triathletes) is small and already difficult to access, the single-case design allows for one or two subjects to be the basis of a study (Kratochwill et al., 2010). In addition, Krathochwill et al. (2010) demonstrated how beneficial the use of single-case design studies can be in providing evidence-based interventions for athletes working with sport psychologists.

However, although the single-case design was particularly appropriate because my target population itself is relatively small, having such narrow inclusion criterion presented a challenge to recruitment. With inclusion criteria requiring participants to be professional triathletes within the Triathlon Canada criteria, but specifically long distance professional triathletes and currently following a structured training plan; this inclusion criteria led to many individuals being
excluded from the study. Many athletes potentially receiving recruitment materials were training as elite athletes but had not yet moved to professional status; and thus were ineligible. Additionally, excluding Olympic or sprint distance professional triathletes again excluded many possible individuals from an already small population. Finally, the structured training plan, though necessary for the study design, was a complication for many possible participants, as the COVID-19 pandemic was still very much affecting races and normal structured training routines. Upon reflection, I would have considered including any triathlete that was recognized as elite status whether they were junior elite, professional long distance triathletes, or elite Olympic/sprint distance athletes.

Another challenge I faced is that it is often difficult to recruit participants when asking them to be engaged in daily research activities compared to participation in a study with a single data collection point, for example. Often longitudinal studies, within which I feel single-case study designs fit, face low consent or recruitment rates (especially when dealing with children or adolescents) that may lead to data that is not representative of the whole population (Eime et al., 2016). Additionally, the individuals that do complete the entire data collection period may be subject to possible increased self-selection bias depending on the nature of the study, which may lead to a bias in findings that is unavoidable and further warranting interpreting results with appropriate caution (Eime et al., 2016).

Additionally, getting participants to keep up with the daily surveys required of them is often a challenge and places a large burden on the investigator. In order to keep all participants accountable, researchers might need to use constant check-ins and reminders for participants to make sure that all participants keep up with their daily tasks. Even with two participants in my
study, there was a great deal of work needed by me to send daily reminder and follow-up with participants. Had I had a large number of participants, this task would be exceptionally challenging and likely require a large number of investigators (or a well-developed, potentially expensive automated process). Eime et al. (2016) present an excellent example of the types of challenges faced with longitudinal/single-case design, and they often need to depend on the efforts of teachers, parents, and other students for participant recruitment and consent processes, as well as to enhance retention of participants for the duration of the study.

An important contribution of my research is providing support for the value to study fluctuations in variables at a sub-domain level, and more specifically the sub-domain levels of self-compassion and grit. Within each of the domains of the psychological variables I examined, it is clear there are differences not just between the variables but within each of them. These results demonstrate how important it is going forward to look not just at daily stability of the variables themselves, but to be able to narrow in on what specific domain within the variable we examine. Given the large differences across the sub-domains of self-compassion and grit seen in this study, there may be better ways to examine and address inadequacies that athletes have within the specificities of the domains. For example, there might need to be targeted intervention for self-kindness, common humanity, and mindfulness separately to enhance self-compassion. Furthermore there might be more specific domains of focus needed. For example, ‘body self-compassion’ was suggested as a highly poignant and relevant area of focus when researchers are looking specifically at individuals dealing with the challenges and psychological trauma associated with breast cancer body changes (Przezdziecki et al., 2012). Research in specific sub-domains can help to narrow a target for psychological interventions to be even more specific in
hopes that the more specific the intervention, the more effective it would be for that specific athlete’s challenges (Przezdziecki et al., 2012). For example, athletes are often very hard on themselves and their bodies, which can negatively affect their well-being as well as performance.

The subdomain of self-kindness can be applied specifically to the physical self and potentially provide better psychological tools for athletes that are facing challenges related to body self-compassion (Berry et al., 2010). Similarly, there are multiple ways that an individual can work to enhance their level of grit. One way is to focus on nurturing and enhancing skills within the realm of self-control/moderation, and another way is that grit can be cultivated through fostering more of an interest in the activity in question (Jeong, 2020). In sum, my research supports the potential value of research in the area of athletes’ responses to training standards continuing to study variables at both the domain and sub-domain level.

Another important contribution of my research is highlighting the potential value of targeted mental performance intervention at the individual level, particularly for high performance athletes trying to achieve daily training standards. As stated by Extebarria (2019),

“A systematic review of objective and subjective measures of athlete well-being to guide training and detect any progression toward negative health outcomes, and associated poor sports performance, indicated that athletes should report their subjective well-being on a regular basis (ideally daily)…Furthermore, focusing on individual rather than group responses…may prove effective in flagging athletes potentially at risk of maladaptation” (Extebarria, 2019, p. 7-8).

As such, supported by my research using a single-case design approach with daily measures, there appears to be much value in understanding fluctuation in psychological variables at the
individual level. Often being able to adjust training standards within a session based on their day-to-day fatigue, health, and overall well-being is an important part of being an elite athlete that may not be adequately captured in group-based analysis. This individual-level focus, along with a focus on sub-domains of variables, might help to professionals offer a more targeted type of mental skills training program that helps athletes on the “knife’s edge” (Bales & Bales, 2012, p. 214) to achieve incremental gains and further their psychological tool kit.

4.2. Limitations

One limitation of my research was the final sample size, which was the result of both (a) challenges in recruitment, and (b) that the target population (i.e., professional triathletes) is relatively small. Small sample sizes are common in single case design studies, which is what makes them particularly useful when the population is already a niche group (Kratochwill et al., 2010). However, my initial goal was to have three to four total participants, to be consistent with Westlund Stewart and Hall (2017) and Callow et al. (2001). However, due to difficulties with recruitment and the rather strict inclusion criteria, only two participants completed my study. Most significantly, having three or four participants would have likely resulted in more than one participant having a naturally occurring intervention point and more adequately allowed me to address my study purpose more fully.

A second limitation is that a large portion of my research overlapped with COVID-19. This pandemic posed challenges to every aspect of research, and my study was no exception. Many athletes at the time of recruitment had not yet returned to sport, and the options of racing at the time of data collection still were still relatively limited. As a result, many athletes were still delaying going back to structured training programs, and many athletes made the choice during
the COVID-19 pandemic to not return to elite level sport at all. This made recruitment of an already small population even more challenging.

A third limitation of my study was that I needed to balance my time and resources in completing my research against being enrolled in the College of Medicine. This posed challenges in time, energy, as well as logistics as I was often needing to complete all recruitment, data collection, analysis within the College of Medicine summer period, which did not always align with the athlete’s lives, or with timing for advisors and other resources necessary to complete my research. I feel that I completed my research to the best of my ability within the parameters of my responsibilities as a student in the College of Medicine in conjunction with my graduate program in the College of Kinesiology. But it was admittedly a significant challenge to do both concurrently, and achieving a balance that also respected my well-being undoubtedly impacted the research process.

4.3. Future Directions

In terms of future research, I recommend a focus on studying the generalizability of my findings, both within the sport of professional triathlon, as well as across different sports and levels of competition. Perhaps even a similar type of study design could be used, but with a larger sample size, and potentially with participants from multiple sports as well. Having more participants would allow for a closer look across participants, perhaps leading to more confident conclusions that could offer stronger insight into the potential for more specific psychological training resources to help athletes navigate through experiences related to trying to achieve daily training standards. Another option would be to move towards a longitudinal design with an analysis that considers both group and individual level factors (e.g., multilevel modelling)
(Rothlin et al., 2023). However, studies with larger sample studies typically require more resources, including additional research assistants, in order to be able to handle the heavy communication (and other research-related factors) needed to make this type of daily data collection a success.

In addition to visual analysis, as was done in the analysis phase of the Westlund Stewart and Hall (2017) study, my original intention was to also conduct statistical analyses by means of percentage of nonoverlapping data points (PND; Scruggs & Mastropieri, 1998, Westlund Stewart & Hall, 2017), and standardized mean difference (SMD<sub>all</sub>; Rosnow & Rosenthal, 1996 as cited by Westlund Stewart & Hall, 2017). PND involves looking at the amount of overlap of baseline and intervention data, and is regarded as a reliable indicator of intervention effects (Scruggs & Mastropieri, 1998). SMD<sub>all</sub> is a calculation of effect size that is used to determine differences between baseline and intervention phases of the study (Westlund Stewart & Hall, 2017). There are guidelines for interpreting results and determining whether or not an intervention effect occurred, which are as follows: “(a) trend of the baseline phase being stable or in an opposite direction of the predicted intervention effects, (b) the effect was replicated within and across participants, (c) a small percentage of overlapping data points, and (d) medium to large effect size” (Westlund Stewart & Hall, 2017, p. 124). The data from PND can provide meaningful information for readers and researchers alike. Scruggs and Mastropieri (1998) described PND scores over 90 (meaning 90% of post intervention readings were above the highest baseline reading) as very effective. Scores in the 70 to 90 range are effective, 50-70 are regarded as questionable, and scores below 50 are seen as ineffective (Scruggs & Mastropieri, 1998). Westlund Stewart and Hall (2017) used the criteria for SMD<sub>all</sub> of 0.25 to indicate a large effect.
size, and 0.09 to indicate a medium effect. It is of note that PND analysis can have high levels of error and should be analyzed with careful attention and potential caution (Westlund Stewart & Hall, 2017). However, due to the nature of the data collected, and the limited number of participants and small sample size, this type of analysis was conducted in my study.

Another recommended direction of future research is finding ways to enhance daily measure adherence. If this is to be a feasible type of study for larger groups, there needs to be available options for participant adherence aside from solely relying on an investigator to monitor each participant individually and contacting them if they are not adhering to daily survey entries. I needed to take on this role as a researcher due to limited resources; however, the personal time and effort needed to collect daily data is not likely a feasible option for most studies. Though the most reliable means of tracking participant adherence likely requires the researcher to manually checking data daily and individually contacting participants if they fail to submit data on a given day, this approach is extremely labour intensive and not a logical or feasible option for studies that wish to include large groups of participants in order to have more generalizable data.

Finally, I recommend finding effective and efficient ways to balance the need for daily measures of assessment against having a sufficiently broad range of variables measured. There needs to be research done to find how to best represent both of these needs. For example, Duckworth and Quinn (2009) developed a short scale grit scale (Grit-S) to try and encompass multiple facets of grit, but I would recommend that measurement of grit, along with self-compassion and self-criticism, need to be further refined for daily-based studies in order to find the correct balance of each in order to accurately encompass all sub-domains while not
overwhelming participants with too arduous a task to complete each day. How well the single-item measures did at accurately capturing my constructs of interest remains an open question; however, having longer, validated, versions of the questionnaires would likely have increased participant burden to the point where having even one participant complete the study might have been unrealistic. It is unclear what the correct balance is or should be, but the length of questionnaires balance against valid assessment remains an important future direction relevant to single case designs.
Chapter 5. Conclusion

5.1. Conclusion

Overall, the take-home message of my research is the lack of stability in the variables I studied, perhaps more so than expected. For example, grit has not been looked at on a daily basis of measurement, and the variability seen in grit may go against what people generally understand grit to be, as the definition of grit is “perseverance and passion for long-term goals” (Duckworth et al., 2007, p. 1087), and it is based on the foundation continuous hard work and investment towards one’s goal [over time], despite being faced with failure, challenges and plateaus in progress (Duckworth et al. 2007). However, many of the standard measures used to assess the various psychological variables in my research require fairly lengthy assessments (i.e., multiple-item measures), and the use of single-items in my research may be a barrier to accurately assess daily changes (and the measures were not originally created as scales meant to be used on a daily basis). Indeed, the majority of studies conducted on the topic of grit are typically longitudinal studies with measurements being done between seasons or even as yearly measures (Duckworth & Quinn, 2009).

In my study, I chose one question from each of the two sub-domains of grit [consistency of interest, perseverance of effort] to represent the entirety of the grit assessment; however, to my knowledge, this was the first time that this method of only two questions for assessment had been used. A similar method was used for the measurement of self-compassion and self-criticism, wherein one to three questions were chosen as a representation of the psychological variable as a whole and its sub-domains within. Which items to choose were not easy choices. To highlight this challenge through another example, within the SCS (Neff, 2003b), there are six
sub-domains of self-compassion (self-kindness, self-judgment, common humanity, isolation, mindfulness, over-identification); however, even for my research I chose only three daily self-compassion questions, largely to reduce the daily participant burden. They key point, is that despite the potential impact of my results in understanding grit, self-compassion, and self-criticism throughout a training period for professional triathletes, it is important to remember that each of the validated scales for assessment of grit, self-compassion, and self-criticism typically have anywhere from 7-26 questions. Hence, we cannot be fully confident that the abbreviated versions of the scales I used represent valid measurement of the variables, and it remains for future research to determine whether the daily fluctuations I observed are representative of “true” daily changes in the constructs themselves or, alternatively, were a result of measurement error associated with using single-time measures (or a combination of both).
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References


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http://dx.doi.org/10.1037/spy0000127


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Appendix A Measures

Appendix A 1 Demographic

The intent of this questionnaire is to collect demographic information and sport training history. Please fill in the questionnaire as accurately as possible.

**Section 1: Demographic Information**

1. What is your sex?
   - Male  
   - Female  
   - Prefer not to say  
   - Other (please specify) _________

2. What is your age?

   16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35

3. How would you describe yourself? You may select more than one or specify, if applicable.

<table>
<thead>
<tr>
<th>Identity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td></td>
</tr>
<tr>
<td>Filipino</td>
<td></td>
</tr>
<tr>
<td>Indigenous</td>
<td></td>
</tr>
<tr>
<td>Japanese</td>
<td></td>
</tr>
<tr>
<td>Latin American</td>
<td></td>
</tr>
<tr>
<td>South Asian (ex. East Indian, Pakistani, etc.)</td>
<td></td>
</tr>
<tr>
<td>Southeast Asian (ex. Vietnamese, Cambodian, etc.)</td>
<td></td>
</tr>
<tr>
<td>West Asian (ex. Iranian, Afghan, etc.)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

64
4. Height in cm: _________________

5. Weight in Kg: _________________

6. Years of training in the sport of triathlon: ____________________

7. Years of competing as a professional triathlete: _________________

8. Injury status: Inured  ○ Not injured  ○
Appendix A 2: Self-criticism Measure

Think about the *most significant negative event in sport* over the *past week* that was personally demanding (such as a setback or failure). Please answer the following on a scale from 1 to 10:

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Scale Options</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How <strong>often</strong> did you have self-critical thoughts about a recent negative sport event?</td>
<td>Had none</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>2.</td>
<td>How <strong>powerful</strong> were your self-critical thoughts about a recent negative sport event?</td>
<td>Not at all</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>3.</td>
<td>How <strong>intrusive</strong> were your self-critical thoughts about a recent negative sport event?</td>
<td>Not at all</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>4.</td>
<td>How <strong>long</strong> did your self-critical thoughts about a recent negative sport event last?</td>
<td>Fleetingly</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>
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5. How **distressed** were you by your **self-critical** thoughts about a recent negative sport event?  
   Not at all 1 2 3 4 5 6 7 8 9 10 Very distressed

6. How **angry/hostile** were your **self-critical** thoughts about a recent negative sport event?  
   Not at all 1 2 3 4 5 6 7 8 9 10 Very harassing

7. How easy was it to **distract** yourself from your **self-critical** thoughts about a recent negative sport event?  
   Not at all easy 1 2 3 4 5 6 7 8 9 10 Very easy

(Mosewich et al., 2013)
Appendix A 3: The Self-Compassion Scale – Athlete Version (SCS-AV)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES IN SPORT

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

<table>
<thead>
<tr>
<th>Almost never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Almost always</th>
</tr>
</thead>
</table>

_____ 1. I’m disapproving and judgmental about my own flaws and inadequacies as an athlete.

_____ 2. When I’m feeling down as an athlete I tend to obsess and fixate on everything that’s wrong in my sport.

_____ 3. When things are going badly for me in my sport, I see the difficulties as part of sport that all athletes go through.

_____ 4. When I think about my inadequacies in sport, 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 in sport.

_____ 6. When I fail at something important to me in sport I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other athletes feeling like I am.

_____ 8. When times are really difficult in sport, I tend to be tough on myself.

_____ 9. When something upsets me in sport I try to keep my emotions in balance.

_____ 10. When I feel inadequate in sport, I try to remind myself that feelings of inadequacy are
shared by most athletes.

_____ 11. I’m intolerant and impatient towards those aspects of my athletic personality I don’t like.

_____ 12. When I’m going through a very hard time in sport, I give myself the caring and tenderness I need.

_____ 13. When I’m feeling down, I tend to feel like most other athletes are probably happier than I am.

_____ 14. When something painful happens to me in sport I try to take a balanced view of the situation.

_____ 15. I try to see my failings in sport as part of the shared athlete condition.

_____ 16. When I see aspects of myself as an athlete that I don’t like, I get down on myself.

_____ 17. When I fail at something in my sport I try to keep things in perspective.

_____ 18. When I’m really struggling, I tend to feel like other athletes must be having an easier time of it.

_____ 19. I’m kind to myself when I’m experiencing suffering in sport.

_____ 20. When something upsets me in sport I get carried away with my feelings.

_____ 21. I can be a bit cold-hearted towards myself when I’m experiencing suffering in sport.

_____ 22. When I’m feeling down in my sport I try to approach my feelings with curiosity and openness.

_____ 23. I’m tolerant of my own flaws and inadequacies in sport.

_____ 24. When something painful happens in sport I tend to blow the incident out of proportion.
_____ 25. When I fail at something in my sport, I tend to feel alone in my failure.

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

(Killham et al., 2018)
Appendix A 4: Grit-Sport

**Instructions:** Listed below are a number of statements that may or may not apply to you as an athlete in sport. There are no right or wrong answers, so please don’t spend too much time on any one statement. Just circle the number beside each statement that best describes you as an athlete in sport.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. As an athlete in sport, I often set a goal but later choose to pursue a different one.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. As an athlete in sport, I have achieved a goal that took years of work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. As an athlete in sport, new ideas and goals sometimes distract me from previous ones.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. As an athlete in sport, I have overcome setbacks to conquer an important challenge.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. As an athlete in sport, I become interested in new pursuits/goals every few months.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6. As an athlete in sport, I finish whatever I begin.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
**Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes**

7. As an athlete in sport, my interests change from year to year.  
   1  2  3  4  5  6  7

8. As an athlete in sport, setbacks don’t discourage me.  
   1  2  3  4  5  6  7

9. As an athlete in sport, I have been obsessed with a certain idea or goal for a short time but later lost interest.  
   1  2  3  4  5  6  7

10. As an athlete in sport, I am a hard worker.  
    1  2  3  4  5  6  7

11. As an athlete in sport, I have difficulty maintaining my focus on projects/goals that take more than a few months to complete.  
    1  2  3  4  5  6  7

12. As an athlete in sport, I am diligent.  
    1  2  3  4  5  6  7

(Cormier et al., 2019)
Appendix A  5 Endurance Sport Self-Efficacy Scale (ESSES)

Below you will find a list of actions and skills that are important for endurance performance. When you are taking part in your endurance sport, how confident are you that you can do the following things. In each case please rate your degree of confidence from 0 (cannot do at all) to 100 (completely certain can do).

<table>
<thead>
<tr>
<th>Cannot do at all</th>
<th>Moderately certain can do</th>
<th>Certain can do</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>90</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

My confidence in my ability to:

1. Manage non-injury related pain
2. Ensure appropriate technique and form
3. Manage my emotions during events
4. Manage injury related pain
5. Manage my thoughts during events
6. Manage and deal with unexpected events
7. Pace myself appropriately
8. Manage and deal with unexpected weather
9. Maintain my concentration
10. Perform well in challenging events
11. Deal with feelings of effort and exertion
Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes

(Anstiss et al., 2018)
Appendix A 6: Perceived Achievement of Performance Standards & Self-efficacy Ratings

- **PRE-TRAINING**: Prior to your training session, please provide a brief description of the performance standards you are trying to achieve in your training session (e.g., Swim workout- main set was 15x100 holding 1:20/100m on a pace time of 1:40). If you have more than one training session today, choose the one that is the most challenging and has the most clearly defined performance standards.

<table>
<thead>
<tr>
<th>Cannot do at all</th>
<th>Moderately certain can do</th>
<th>Certain can do</th>
</tr>
</thead>
</table>

0 10 20 30 40 50 60 70 80 90 100

- In your training session, how confident are you that you can achieve the performance standards you are trying to achieve in your training session. Please rate your degree of confidence from 0 (cannot do at all) to 100 (completely certain can do)

- **POST-TRAINING**: Based on the performance standards you were trying to achieve in the training session, please select one of the following three options:
  - *I did not meet the training performance standards*
  - *I met training performance standards*
  - *I exceeded training performance standards*
Appendix A 7: Short scale Self-Compassion and Self-Criticism Questions

Think about the most difficult part of your training today and respond to the following questions with that in mind. Keep in mind that the event you are recalling could have been quite bad or could have been very minor. Now please rate your reaction in the way that you recall to the varying degrees.

<table>
<thead>
<tr>
<th></th>
<th>1-</th>
<th>2-</th>
<th>3-</th>
<th>4-</th>
<th>5-</th>
<th>6-</th>
</tr>
</thead>
<tbody>
<tr>
<td>I tried to be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kind to myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I tried to make</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myself feel better</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I kept the</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>situation in</td>
<td></td>
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<td>perspective</td>
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<td>I was really</td>
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<td>hard on myself</td>
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(Leary et al., 2007, Reis et al., 2015, N. Reis, personal communication, January 18, 2021)
Appendix A 8: Short scale Self-Compassion and Self-Criticism Questions

**Short Scale Questions- Grit**

**Instructions:** Listed below are two statements that may or may not apply to you as an athlete in sport. There are no right or wrong answers, so please don’t spend too much time on any one statement. Just circle the number beside each statement that best describes you as an athlete in sport today.

<table>
<thead>
<tr>
<th>Not at all like me</th>
<th>Somewhat like me</th>
<th>Exactly like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. As an athlete in sport, I set a goal/standard before beginning my session today but then later in the training session chose to pursue a different one</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. As an athlete in sport, today I overcame setbacks in my training session</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
to meet an important goal/standard

(D. Cormier, personal communication, January 11, 2021; Cormier, et al., 2019)
Appendix A 9: Participant Consent Form

**Participant Consent Form**

You are invited to participate in a research study entitled: Stability of Self-Criticism, Self-compassion and Grit in Professional Triathletes in Training

**Student Researcher(s):** Abby Miller, graduate student, College of Kinesiology, University of Saskatchewan, abby.miller@usask.ca, (306) 900-0169

**Principal Investigator/Supervisor:** Dr. Kent Kowalski, Professor, College of Kinesiology, University of Saskatchewan, kent.kowalski@usask.ca, (306) 966-1079

**Purpose and Objective of the Research:**
- The purpose of this study is to observe the stability of self-criticism, self-compassion and grit; more specifically in the context of perceived achievement of standards within training.

**Procedures:**
- Your participation will involve completing an online survey at daily time points (5 days in a week), spanning 3 weeks in total, with pre and post-test surveys completed before and after the 3-week period. Daily e-mail reminders will be sent to you each day at 6 AM and 6 PM for the duration of the 3-week testing period. You will complete the survey measures, including general information like your age and sport participation, along with items focused primarily on self-criticism, self-compassion, grit, and perceived achievement of standards. Most survey items will require you to rate how much or how little you agree with the statements presented, on a scale (e.g., “rate how much you agree with the following statement on a scale of 1 to 5, with 1 representing ‘strongly...
disagree’ and 5 representing ‘strongly agree’). You will not be asked about your general information, like age, after the initial questionnaire.

**Potential Risks:**
- There are no known or anticipated risks to you by participating in this research. You have the right to not answer any question, and you may skip questions you feel uncomfortable answering, without any penalty. Also, withdrawing from the study will result in no penalty to you or anyone else. Although we do not expect any psychological risk, the research project may be sensitive in nature for you. If you feel uncomfortable continuing with the survey, you can stop at any time, and there will be no penalty. If you wish, any data collected prior to this point will be omitted from the study and destroyed. Below is a resource you can use if you would like professional help dealing with your personal experiences.

- **University of Saskatchewan Health Services** – (306) 966-5768
- **University of Saskatchewan Counseling Services** – (306) 966-4920
- **Saskatoon Crisis Intervention Services** – free help line: (306) 933-6200
- **Crisis Services Canada**— https://www.crisisservicescanada.ca/en/looking-for-local-resources-support/

**Potential Benefits:**
- Benefits of participation in this study cannot be guaranteed, but you may develop an increased understanding of self-compassion, self-criticism, and grit, which may play a role in easing difficult experiences in sport. Little research in this area has been conducted with a population of professional athletes, so the results of this study may be beneficial to you and other individuals who participate in elite level sport.

**Confidentiality:**
- The data from this study will be used to complete the student investigator’s MSc. thesis, and may appear in a scholarly journal and/or be presented at an academic conference. However, your identity will be kept confidential. Although the data from this research project will be published and presented at conferences, the data will be reported in aggregate form so that it will not be possible to identify individuals. The intent is to keep each participant separate and their identity confidential; however there are limits on that confidentiality beyond our control in that some of the recruitment in the study will be done by means of referral. This means that we cannot be sure of what the initial referring person will say to the subsequent 2-4 athletes they contact. It should be noted, that given the nature of the recruitment and the size of the professional triathlon community, there is possibility of identification simply due to size, which is a limitation.
Stability of Self-Criticism, Self-Efficacy and Grit in Professional Triathletes

to confidentiality when considering participating. Also, the student investigator will only have access to your email address as a potential identifier, which will not be connected to your survey responses. This survey is hosted by Survey Monkey. Your data will be stored in facilities hosted in Canada. Please see the following for more information on Survey Monkey’s Privacy Policy.

Storage of Data:
- All research material will be securely stored on the survey tool (i.e., Survey Monkey), which is only accessible to the student investigator and principal investigator. Eventually, the data will be moved from the survey tool into an encrypted password protected file that can only be accessed by the student investigator and principal investigator. Upon publication of the study, the data will be stored in the encrypted password protected file for a minimum of 5 years post publication, before eventually being deleted.

Right to Withdraw:
- Your participation is voluntary and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reasons, at any time without explanation or penalty of any sort. Should you wish to withdraw from the study, any data that you have contributed will be destroyed at your request. However, your right to withdraw data from the study will only apply until July 15the 2021. After this date, it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

Follow up:
- A summary of the results of the study will be distributed by email to all participants upon completion of the research, by the student investigator, Abby Miller.

Questions or Concerns:
- Contact the researcher(s) using the information at the top of page 1.
- This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out of town participants may call toll free 1-888-966-2975.

By completing and submitting this questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.