

**COPING WITH INJURY IN POWERLIFTING: STRESS-INJURY MODEL  
PERSPECTIVE**

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## ABSTRACT

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A need to evaluate psychological antecedents to injury in strength-based sports is evident. Powerlifting especially has seen a rise in participation rates (International Paralympic Committee; Powerlifting Australia Ltd.; British Weight Lifting), also resulting in an increase in weightlifting-related injuries (Metzger et al., 2012). While much literature exists on mental stressors and coping mechanisms athletes encounter in the sport context, minimal research has attempted to understand how athletes involved in strength sports cope with stress and injury. The nature of strength sports overall differs from contact, speed-based, or even aesthetics-based sports. These essential differences are hypothesized to bring about specific stressors, thereby different coping styles in competitive powerlifting. The purpose of this thesis was to examine competition and life stressors, experiences related to injury, and coping mechanisms in competitive powerlifters. This study used a cross-sectional, narrative design rooted in Williams and Andersen's (1998) stress-injury model as the primary theoretical lens. Participants were eight (n=8) male competitive powerlifters from various national backgrounds, aged 18-28 years with past physical injury in need of rehabilitation. Data were collected through semi-structured interviews, which included questions about athletes' past injury(-ies), stressors experienced in powerlifting, and coping with stress and injury. Deductive content analysis revealed that powerlifters experienced stressors such as weight cutting, the "post-training blues" phenomenon, overthinking, and feelings of anxiety and worry about reaching their goals. Common daily hassles including school- or work-related events were reported as sources of stress in their personal lives. Lower back injury requiring physical therapy was the most common type of injury experienced. Avoidance coping styles were utilised in injury contexts compared with other stress contexts. Means of coping with injury included training around their injured muscle groups and seeking information about their injuries. Coping with stress results include planning and establishing a routine, and adopting an "it's outside of my control" mindset. Overall, powerlifters appeared to be at risk to similar psychological predictors to injury incidence as other athlete groups are, although they experienced several stressors and engaged in coping mechanisms unique to powerlifting. Implications for clinicians and future research are detailed.

*Keywords: coping, stress, competitive powerlifting, injury, antecedents, weightlifting, strength sport*

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## 1 INTRODUCTION

Strength-based sports – those that require a demonstration of strength/power through a series of lift/movement attempts – have often been under-researched in sport psychology literature when compared to other sports (e.g. contact sports, physique-based sports). Powerlifting, in particular, has become a considerable sport. It is a strength-based sport with three weighted attempts in three lifts: the deadlift, the bench press, and the squat. Participants are typically categorised by age and weight classes, and can be male or female, with competitions/meets occurring through various powerlifting organisations globally. The International Powerlifting Federation (IPF) has become the primary organisation to host the world championships for all age and weight categories in powerlifting, where participants must qualify in order to compete. The most intriguing aspect of powerlifting from an academic perspective is its rise in recreational and competitive participation. Both the International Paralympic Committee (IPC) and Powerlifting Australia Ltd. (PAL) have cited a growth in memberships and competitions in their 2013-2016 and 2014-2016 strategic plans, respectively. Similarly, British Weight Lifting (BWL) has also seen a rise in participation, especially from Britain's female population, as has been reported by Sport England through the Active People Survey (2015). In addition, Metzger and colleagues (2012) point out the increased prevalence of a once-rare injury to the pectoralis major due to the increased popularity of recreational weightlifting, in particular the bench press.

Any new and emerging human behaviour brings with it the necessity to explain how and why it has come about. Likewise, with this participation rise in weightlifting and powerlifting and an increase in injury rates from these sports, comes a need to understand strength-based sports from a psychological lens, due to its impact on sociological and political spectrums such as the healthcare system (need for surgery, diagnoses, rehabilitative practitioners) as well as the economy and job markets (entrepreneurial businesses for private or chain weight rooms and gyms, an increase in strength and conditioning coaching and trainer jobs). Thus, it is important to take into consideration the reasons why athletes have an inclination toward competitive powerlifting, and the nature of the variables that effect their training, competitions, personal life, and potentially injury sustainment. These variables will be explored through Williams and Andersen's (1998) stress and injury model.

## 2 LITERATURE REVIEW

### 2.1 Stress and injury model

The theoretical framework that will contextualize this study is the stress and injury model by Williams & Andersen (1998). This model serves to be a means of classifying the stress response as an event that is influenced by various preceding factors (the antecedents), in that they affect how the stress response is appraised, and whether the occurrence of an injury is the final outcome. These antecedents – athlete personality, history of stressors, and coping resources – are believed to influence one another, but may also act singularly on the stress response. Other psychology of sport injury theories exist, such as Wiese-Bjornstal, Smith, Shaffer, & Morrey's (1998) integrated model of response to sport injury. However, this theory primarily focuses on the psychological outcomes to sport injury in terms of personal, behavioural, cognitive, situational and emotional sequelae, as opposed to the psychological antecedents that may result in an injury event. While Wiese-Bjornstal et al.'s (1998) approach takes into consideration these antecedents, the breadth of such a theoretical lens is too wide for the purpose of this thesis.

More specifically, according to literature, many personality characteristics modulate the stress-illness relationship, although it will be less explored through this thesis. These include trait anxiety (Petrie, Deiters, & Harmison, 2014; Johnson, 2004; Vago, Casolo, Lovecchio, Colombo & Gatti, 2013; Lavalley & Flint, 1996), locus of control (Johnson, 2004; Pargman & Lunt, 1989; Kolt & Kirby, 1996), and achievement motivation. Locus of control refers to the extent in which an individual perceives outcomes to be within their control (Johnson, 2004). An athlete with a high internal locus of control will believe that an event, situation or circumstance is fully within their control. On the other hand, an athlete with high external locus of control will believe that an outcome is outside of their control. A study by Pargman and Lunt (1989) illustrates that injury is correlated with having a high external locus of control. This is in contrast to Kolt and Kirby's (1996) findings of no significant correlation between locus of control and injury outcome in their sample of sub-elite gymnasts; however, in their sample of higher-level or elite gymnasts, they found that having a greater internal locus of control is more likely to result in injury. Due to the lack of current research and mixed results when looking at locus of control relating to injury, Johnson (2004), and

Petrie, Deiters and Harmison (2014) determine that more research is needed, and other personality variables must be looked into. Trait anxiety has also been proposed to moderate the stress-injury relationship. It is a behavioural disposition when reacting to threatening circumstances with inordinate anxiety (Johnson, 2004). Individuals with high trait anxiety will similarly experience higher state anxiety in the respective anxiety-inducing circumstances. Petrie et al. (2014) have indicated that competitive trait anxiety has received support in literature. This is illustrated in part by Lavallee and Flint's (1996) work with a group of athletes who were more often injured if they had high competitive anxiety. More recent work has seen similar, confirmatory results (Vago et al., 2013). This particular study sampled 100 male amateur soccer players whom filled out two questionnaires. The results illustrate positive correlations between both tendinopathies and fractures with both state and trait anxiety (Vago et al., 2013).

History of stressors within the scope of the stress and injury model (Williams & Andersen, 1998) includes major life events, daily hassles and previous injuries (Johnson, 2004). Major life events have been the most researched component from the model, where Williams (2001) states that 35 studies have illustrated a mostly positive correlation between major life events and athletic injury. Even more recently, Wadey, Evans, Hanton and Neil (2012) have used the Life Events Survey for Collegiate Athletes (LESCA) to measure major life events prior to injury for 694 athletes, and have found that negative major life events predict injury occurrence, but not positive life events.

Another focus of this study will be coping resources; more specifically, how athletes cope with their injuries. According to the stress and injury model (Williams & Andersen, 1998), coping resources primarily deal with behaviours and/or social networks which aid in how individuals deal with problems, setbacks and joys of life (Johnson, 2004). Johnson (2004) also states that when athletes have good coping resources, it may directly protect them from injury, or it may decimate the negative effects of stressors or personality. An example of this from literature includes Hanson, McCullagh & Tonymon's (1992) study, which found that those who were injured tended to have significantly fewer resources for coping than non-injured counterparts. Furthermore, social support is one form of coping resource that has been shown to moderate the stress and injury model either directly (Hardy, Richman, & Rosenfeld, 1991) or indirectly (Petrie, 1992) through life stress as the primary variable. The

foremost notion of the stress and injury model in terms of coping is that a stressor's impact is shaped by an athlete's appraisal, coping mechanisms, and the availability of resources for successful management of the stressor (Kolt, 2004). This notion certainly emphasizes the importance of coping from an injury rehabilitative standpoint, particularly when all data points to impractical management of stress increasing likelihoods for an injury outcome. Apart from social support, other means of coping include stress management skills, nutrition, and sleep habits (Kolt, 2004).

Other important variables within Williams and Andersen's (1998) stress and injury model include physiological responses and cognitive appraisals within the stress response. Cognitive appraisals of the stress response have bidirectional involvement with the physiological reactions to stress. Several physiological responses that occur in a stress state include muscle tension, peripheral visual narrowing and increased distractibility – all believed to be the underlying mechanisms responsible for the increased injury risk associated with increased stress (Johnson, 2004). These physiological signs of stress are important to take into consideration for athletes. In example, increased muscle tension may lead to reduced flexibility and a change in muscle coordination for a specifically required movement in the sport context. Such unwarranted change may increase the risk of injury susceptibility (Kolt, 2004). When this increased muscle tension occurs, when attentional cues are shifted (such as visual narrowing) and the athlete is more distracted, it is clear how an increased risk to injury becomes more probable when an athlete is psychologically stressed. These are all antecedents to sport injury to consider when studying the field of injury and rehabilitative psychology. This thesis will continue towards current research in the field of stress and injury, and how athletes cope with stress.

## 2.2 Stress as an antecedent to sport injury

Assessing psychological stress as a general variable in the sport of powerlifting is uncommon in current literature, particularly stress pertaining to injury. In addition to this, certain types of stress-specific variables are difficult to find in literature. Sport-related stress is not often researched within the stress and injury model (Dunn, Smith & Smoll, 2001). A study by Mellalieu, Neil, Hanton, and Fletcher (2009) assessed the influence of competition stress on elite and non-elite athletes. While injury outcome was not a primary concern for the purposes of their study, a theme that came up during semi-

structured interviews was categorized as “injury” (Mellalieu et al., 2009). More precisely, the authors identified elite and non-elite athletes who would worry about their risk of sustaining an injury, particularly if they had been competing with an already-sustained injury. This fear and risk of (re-)injury was categorized as a stressor in competition. Generally speaking, several other athlete-cited stressors to have come up include internal and external expectations, performing to their abilities, importance of the competition, technical/tactical/physical preparation, physique, coach evaluation, the setting of the competition, funding/income, among others (Mellalieu et al., 2009). In addition, Anshel (2001) indicates in his review of literature that athletes will often experience acute stress within competition. This includes receiving unpleasant feedback from coaches, making errors, experiencing pain and injury, and poor officiating. In another study, Dunn et al. (2001) made an effort to differentiate sport-related stress from general (or life) stressors as they relate to injury. Using a 50-scale Sport Experiences Survey (SES) with a sample of 425 high school athletes, the authors of this study found that sport-specific stressors predicted athletic injury beyond general life stress for female athletes ( $n=189$ ), but not for male athletes ( $n=236$ ). The results highlighted the importance of differentiating between general life stress and sport-related stress when assessing the relationship between stress and injury.

A more common stress variable is life stress, and how it influences injury outcome. Major negative life events have predicted injury rates in accordance with past research literature. Johnson and Ivarsson (2011) published their study on assessing multiple factors of the stress-injury model in a sample of junior soccer players. Their study finds that negative life stress predicts the rates of injury. They hypothesize that this may be for several reasons, including that in a psychologically stressed state, athletes’ perception to sport-relevant cues may be clouded. Another reason may be due to the moderating nature of “major life event” stress. That is, stress may impact personality characteristics such as state/trait anxiety personalities, and how athletes cope with stressors. This is in contrast to a study by Petrie and colleagues (2014), who demonstrated in their study with collegiate football players that neither positive nor negative life events were correlated with athletic injury occurrence. Both studies used the Life Events Survey for Collegiate Athletes (LESCA). The LESCA was developed by Petrie (1992) with an 8-point Likert scale measuring 69 life events. The test-retest reliabilities ranged from .76 to .84 (Petrie, 1992). Ivarsson, Johnson, Lindwall,

Gustafsson and Altemyr (2014) examined 101 elite junior soccer players' daily hassles and uplifts throughout a 3-month period, and related it to injury outcome. Their results indicate that higher levels of hassles, and lower levels of uplifts would lead to greater risks of sustaining an injury. They also found that when there is a higher level of initial hassle, and less change in hassles (therefore less positive change in small stressors) were positively correlated with injury outcome. In addition, a more dramatic drop in levels of uplifts were more associated with injury risk (Ivarsson et al., 2014). Another prospective study by Ford, Eklund and Gordon (2000) illustrated that several variables moderated the relationship between negative, positive, and overall change in life stress, and injury occurrence. Moderator variables that were supported in this relationship included dispositional optimism, global self-esteem and hardiness. According to their discussion, Ford, Eklund and Gordon (2000) state that certain personality characteristics such as being an optimist and being hardy, will allow the athlete to cope with greater efficiency. Behavioural research by Scheier and Carver (1992) would illustrate that optimists have a tendency to use active problem-focused coping and tend to have greater emotional control.

### 2.3 Coping with injury

According to Lazarus (1993), stressors will be appraised based on an individual's personal meanings they hold about their commitments, values or goals. Therefore, the form of coping an athlete will utilize will depend on how they perceive their stressors. While many definitions of coping exist in psychology literature, the definition adapted by Crocker, Tamminen and Gaudreau (2015), where coping can be seen as "all effortful cognitions and behaviours an athlete employs to manage constantly changing perceived important adaptation challenges" (p. 30). In order to understand how athletes cope with injury, it is important to first understand the general coping literature, and how athletes cope with stress – particularly because injury can induce a stress response. Several forms or classifications of coping exist, as they pertain to coping literature. More specifically, according to Crocker et al. (2015) micro-analytic forms of coping utilized by athletes include avoidance, problem-solving, planning, arousal control, seeking social support, increasing effort, and more. Other forms of coping for after or during injury rehabilitation include improved mood, self-efficacy and psychological flexibility (Reese, Pittsinger & Yang, 2012). This was based on a review the authors conducted as their search criteria. The results of their review also found that interventions for healthy

psychological recovery from sport injury rehabilitation include guided imagery, relaxation methods, and goal setting. Thus, these interventions can be seen as sources of coping that athletes can learn to use to improve psychological coping. In addition, Reese, Pittsinger and Yang (2012) found that many athletes who underwent mental skills training interventions for their rehabilitation would seek social support more than they did before the intervention. A qualitative study by Crocker, Tamminen and Gaudreau (2015) presented evidence about how athletes cope with stress including controlling thoughts and emotions, and behavioural strategies (e.g. distraction, making and following a routine).

Macro-analytic forms of coping are broader classifications for coping. This includes problem- and emotion-focused coping, as defined by Lazarus and Folkman (1984). Problem-focused coping involves identifying a problem, generating solutions, assessing cost-benefit analyses, choosing which option is best to execute, and executing the chosen solution. This type of coping is more likely to be utilized when a situation is appraised as under the person's control. Emotion-focused coping aims to exert control over a person's internal emotional processes. This can include lessening emotional distress, such as avoidance, positive comparisons, etc., and is likely to be used when a situation appears to be completely out of control of the person. Anshel (2001) further suggests harm/loss appraisals of stress within sport can be useful for athletes when they find themselves in situations requiring little to no control on their part, because they will exhibit avoidance coping. Avoidance coping is a term to indicate individuals (athletes) whom attempt to escape from the stressor, whether through behavioural or cognitive means. This is opposite of approach coping, in which the athlete will have a tendency to cope by involving or addressing the stressor (Roth & Cohen, 1986).

### 3 PURPOSE OF STUDY

The purpose of this thesis was to investigate the coping mechanisms used by competitive powerlifters in stressful and injury events. The stressors experienced throughout the competition season and the personal challenges of the athletes were explored. In addition, athletes' coping strategies used to deal with such stressors and their injuries were assessed. Descriptions of injuries sustained and experiences are made, and potential links to the stress-injury relationship was analysed.

## 4 METHODS

### 4.1 Participants

Through the researcher's academic network, one initial powerlifter was approached for recruitment contacts (seeking participants). Snowball sampling was used henceforth. Six powerlifters were contacted at first regarding participation in the study, and 12 had contacted the researcher through network recruitment. Eleven participants met the inclusion criteria, but three dropped out before the interview. Total participants in the study were eight (8) male powerlifters with a history of injury. Participants were 18-28 years of age ( $M=23.75$ ,  $SD=3.54$ ), with nationalities from Canada ( $n=3$ ), the United States ( $n=2$ ), Hong Kong-China ( $n=1$ ), Slovenia ( $n=1$ ), and the United Kingdom ( $n=1$ ). Participants competed in the 74-140kg weight classes, with the 83-kilo class being most reported ( $n=3$ ). Participants' Wilks Coefficients, a calculation of powerlifters' overall strength, ranged from 311-504 ( $M=415.20$ ,  $SD=65.72$ ). Sampled powerlifters had participated in competitive powerlifting from 1-11 years ( $M=4.13$ ,  $SD=3.10$ ). Inclusion criteria for participation was as follows: male powerlifters, one-time access to Skype for several hours, fluent in the English language (must be able to comfortably speak of life experiences and emotions, especially regarding sport, injury and stress), must be competitive in powerlifting (participation in local, national or international competitions), must have sustained past/current musculoskeletal injury where training had to be put on hold and be able to recall/talk about it, must have gone through a rehabilitative process for injury, be willing to consent to participation. Data collection was terminated when results yielded no new codes and information.

### 4.2 Instrument

Single semi-structured interviews were conducted with the participants. Interview questions (appendix A) were constructed in a way to avoid interpretational/biased questioning, but to open dialogue about the participants' experiences and stories. The questions focused on retrospective reflection of experience. Interview questions were designed by the researcher based on theory, and previous knowledge of powerlifting, and had been edited by supervisors associated with this thesis. Stress and coping literature often acknowledges the differences between life events stress and sport-related/performance stress. For this reason, questions were phrased in a way that allowed athletes to express various stressful incidences in their personal lives as well as

in powerlifting. The participants were asked about the stressors they experience in three time points of the training cycle: competition training, the time before competition begins, and the competition meet. Participants were also asked a series of demographic questions, and about the stressors in their personal life, the nature of their injury/ies, how they have dealt with such stressors, and how they have dealt with their injury/ies. Appropriate probing questions such as, “could you tell me more about that?” etc., were used throughout the interview. Interviews ranged from 30-120 minutes in length. Interviews were recorded on an audio program called *Audacity*, and transcribed immediately following the interviews.

#### 4.3 Procedure

The thesis is a cross-sectional, narrative design. Narrative design was selected based on the nature and purpose of this research; because powerlifters (or more broadly, strength sport athletes) are a population subset that are relatively unexplored in the sport psychology field, qualitative interviews were an appropriate means of understanding behaviours such as coping, and exploring variables such as stressors and other demographic enquiries. In particular, narrative design allows athletes to freely express their experiences through detailed narratives, extracted by open-ended questions. Individual semi-structured interviews were conducted in November 2016 and January 2017 through Skype video conferencing. Ethical consent was addressed and given prior to data collection.

#### 4.4 Data analysis

Recordings were transcribed verbatim immediately following the interviews. Transcriptions were read over several times to ensure accuracy. Prior to coding, participants were sent their transcriptions to read over what they had said; they were told that if they wanted to elaborate/edit something that was said, proof-read the transcripts, or add/modify the information, that they may do so. This was done as a form of member checking to enhance credibility of the study. Generally, transcripts were left without modifications by the participants; two participants clarified several misheard words, but nothing was changed to the point where meaning was altered. A deductive analytical approach was used to obtain raw codes of the data through *ATLAS.ti*. The interview questions were rooted in the stress-injury theory (Williams & Andersen, 1998), and the codes were developed based on theorised and unexpected outcomes. In

addition, data was deductively analysed based on Lazarus and Folkman's (1984) problem- and emotion-focused coping, as well as Roth and Cohen's (1986) avoidance coping schemes. Initial codes and associated quotes were sent to a second coder to ensure reliability of results. A second coder was a first-year SEPPRO student at the University, who was familiar with concepts of coping and the sport of powerlifting. The second codes were discussed and deliberated with the primary author, and appropriate merges and editions to codes were made. Higher-order themes were then generated based on the edited codes.

#### 4.5 Ethical consent & concerns

The consent form addressed several issues of data storage and personally identifiable information. Participants were told that all data collected from interviews will be kept on a password-locked hard drive, and could only be accessed by the primary researcher. No personally identifiable information was revealed at any point in the data collection process; data files were saved according to a numerical assignment for each participant. Participants were informed that if emotional upset, anger, or any other unpleasant feelings were to arise, they were allowed to leave the interview without obligation. If they chose to leave the interview for any other reason, they were also allowed to do so. Participants were not given any compensation for their participation in this study. All data will be safely destroyed upon the completion of the thesis.

## 5 RESULTS

Hundred and twenty codes were generated through thematic analysis from 87.5 pages of single-spaced transcription text. Upon second coder analysis, 102 codes have been finalised. Higher-order themes have been generated primarily based on the nature of the questions explored, including coping with stress, coping with injury, stress in powerlifting, and life stressors. Themes that are presented throughout this section are those that have a high frequency throughout the data, and results that are new or unexpected. Personality characteristics, personal growth through powerlifting, and the interconnectedness of different aspects of life also emerged as themes that stemmed outside of the theory-based higher order themes. Although life stressors and powerlifting stressors were treated as separate entities throughout data collection,

analysis allowed for an emergence of certain notions, such as the interconnectedness of different aspects of life, and personal growth through powerlifting. It is not appropriate to treat such themes as sources of stress or sources of coping, as they may be considered a macro-structural theme resulting from powerlifting. Figure 1 is a summary of themes generated in this study. Coping mechanisms are at the centre of the diagram, and are influenced by injury, personality characteristics, powerlifting stressors (training, pre-competition, and competition), and life stressors (life events, daily hassles). The latter two variables are linked in their similarity of their distressing effect on a powerlifter, while powerlifting stressors and injury are linked in a correlative nature. The variables are representative of the powerlifting experience, and are enclosed in a circle. The external arrows symbolise personal growth through, and interconnectedness of all aspects of life with powerlifting.

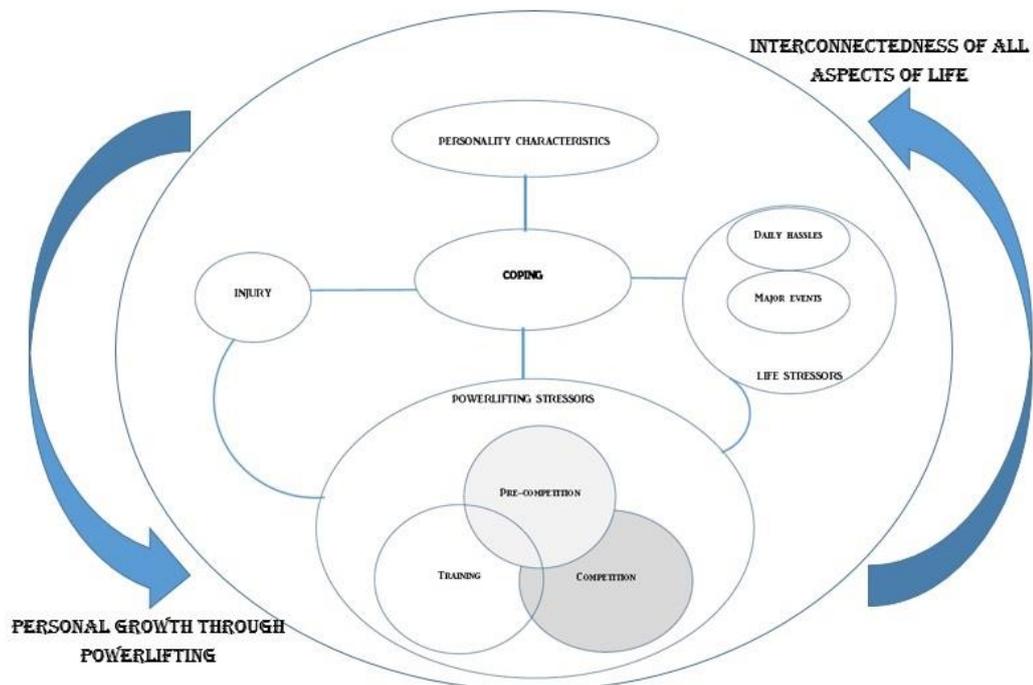


FIGURE 1: Emerging themes related to coping with powerlifting injuries.

The interview guide did not take into consideration personality characteristics, as it was not the purpose of this thesis. However, personality characteristics emerged throughout the data. Many (n=5) of the participants would cite how they view themselves when they describe how they have dealt with stressors in their lives. For example, two of the participants mentioned that overall, they, “feel like my life is pretty stress-free, I don’t get stressed about stuff. But I guess that might be just because I’m

quite care-free,” (participant 4) as well as that they are, “generally kind of stoic in my demeanor and approach to life and competition” (participant 6). A sense of easy-goingness and laxity towards life and stress is indicative of a low state anxiety personality. Participant 6, however, eluded to a high trait anxiety personality. He says:

“I think earlier in my training career one of the reasons why the stress did get to me so much or effect me so much cuz I’m naturally a really laid-back person. . . . And so then when something does matter to me a lot, when I do put a lot of psychological weight on something and I don’t perform well, I think I respond to that stress poorly because I’m not used to it. Because I don’t let hardly anything get to me, so when I do let something get to me, it kind of petrifies me.”

Other personality characteristics cited by participants included achievement motivation, initially proposed by Andersen and Williams (1988). Specifically, participant 2 details:

“I was almost absolutely 100% un-influencable, where if I didn’t want to go out and drink, and they tried to get me to go out and drink or go out and stay out late, you know how it is peer pressure and all that stuff, I was bullet proof. It didn’t matter how much you tried to pressure me; I rather not be friends with that person, than be friends with them and detract myself from my goals. For me I had such a laser focus on these are the things I have to do to become the person I want to become, and I really did not care whatsoever for vast majority of the time, whether I had to be alone doing it or whether I had people around me.”

Sport achievement motivation is exemplified by participant 2 when he describes the extent to which he was motivated by his life goals. He wants to be the best powerlifter, and explains the sacrifices he had to make in order to achieve his goals; he was so motivated by his desire to achieve his career and powerlifting goals that he often endured isolation and feelings of sadness. However, he also explains that these are merely consequences of becoming the best, and never questioned his choice. His achievement motivation may have even been a factor in his “ignorance” to avoid help-seeking for his injury. Achievement motivation is also demonstrated by participant 5 when he says, “there’s a desire to beat my previous performances such in a competition setting. . . perhaps having a feasible game plan for the day of the competition. Making sure it’s reasonable, but also pushes me to a foreseeable, my foreseeable limits.”

Participant 5's motivation to achieve his goal of being a great powerlifter is demonstrated in his drive to beat himself; in competitions, he will ensure he pushes his own limits in order to gain greater confidence in his capabilities. In this case, participant 5's achievement in powerlifting stems from his motivation to become the best powerlifter he can be. Often, pursuing greatness is a stressful process, whether viewed as eustress or distress.

### 5.1 Participant injuries

All participants were asked a series of demographic questions in order to generate a fuller picture of their experiences in competitive powerlifting. Table 1 summarises the reported injuries. Seven participants experienced a form of back injury, which was the major injury incurred through powerlifting for most of them (71.4%). Other injuries included hip, glutes, hamstring, wrist and knee. Participants were asked to rate their major injuries in terms of perceived mental stress on a scale of 1 (least stressful) to 10 (extremely stressful). The participants reported stress levels associated to these injuries ranging from 6 to 10 ( $M = 7.93$ ,  $SD = 1.24$ ). Ongoing injuries are in reference to participants whose injuries did not heal by interview date. The average time of ongoing recovery was 18.75 months ( $SD = 12.04$ ), accounted for in 4 participants. Mean recovery period was 2.81 months ( $SD = 2.05$ ) ranging from 0.5 to 8 months. Some of the participants sustained several injuries. For example, 2 participants reported between 3 and 6 injuries.

Table 1 represents a summary of injury classifications according to recovery and perceived stress values. Powerlifting injuries were conceptualised in terms of time required to rehabilitate, and by the mental stress powerlifters experienced according to injury type. Injury classifications were based on major muscle groups or movements, as well as whether the injury recovery was ongoing at the time of the interview.

TABLE 1: Summary of major injury classifications. Mean recovery period of glute injuries could not be accounted for due to both short-term and long-term (ongoing) recoveries of the two injuries reported.

Injury	Frequency	Recovery in months ( <i>M, SD</i> )	Perceived stress ( <i>M, SD</i> )
Low back	5	3.6, 2.70	8.40, 1.14
Low back (ongoing)	2	23, 18.38	8.25, 0.35
Hip	2	2, 1.41	6.50, 0.70
Knee	1	3.50	10
Hamstring (ongoing)	1	18	8
Glutes	2	2.50, 0.70	6.50, 0.70
Other joint injuries	2	2.50, 0.70	8.25, 1.06

## 5.2 Psychological stressors in powerlifting

Participants were asked a series of questions regarding various stressors in their life and powerlifting. Table 2 presents the most often reported stressors reported by participants. The powerlifting season was divided into ‘stress in training,’ ‘pre-competition stress’ (defined by most [ $n=6$ ] participants as one week prior to competition), and ‘competition stress,’ respective of the time frames of a powerlifting season. These time frames were the basis of the stressor results. Frequency addresses the number of occasions in which the stressors appeared in data. Results yield 17 stressors in training, 13 in the pre-competition phase, and 21 in the competition phase. A total of 32 stressors within a powerlifting season have been reported and summarised.

TABLE 2: Top 15 most reported stressors within the powerlifting season. Under frequency, bracketed data represents how often stressor was reported in the respective time frames.

Stressor	Frequency	Time Frame
Overthinking	13 (5, 4, 4)	Training, pre-competition, competition
Spoiled plans	13 (8, 5)	Training, competition
Lack of support	11 (8, 3)	Training, competition

Not hitting expected numbers	10 (6, 4)	Training, competition
Mental, physical fatigue	9 (4, 2, 3)	Training, pre-competition, competition
Isolation	8	Training, pre-competition
“Post-training blues”	7	Pre-competition
Life circumstances	6 (5, 1)	Training, pre-competition
Making weight	6 (5, 1)	Pre-competition, competition
Social comparison	5 (1, 2, 2)	Training, pre-competition, competition
Off days, bad days	5 (4, 1)	Training, competition
Results of meet	5	Competition
Worry, anxiety, frustration about program	4	Training
Travel, accommodation	4	Pre-competition
Impact of sport on life	4	Competition

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Several similar stressors were noticed in all three time frames of a powerlifting season (Table 2), one of which is when athletes overthink or get in their heads. For example, throughout training, participant 3 mentioned that:

“one of the things I usually do after a bad training session is I’m just gonna be obsessing with like calculating with all these angle and be like, okay what did I do wrong with this training session? . . . being obsessed with being perfect and that just messes my head a little because I know that at that moment I wasn’t being perfect, I wasn’t doing the best I can.”

Here, he demonstrates that when a training session does not go as he intended, he will analyse what he did wrong, he will “obsess” with attempting to fix it, and acknowledges that this cycle of thinking will “mess” with his head. Similarly, in the pre-competition phase, participant 7 has said he is, “always worrying what my numbers are gonna be like on meet day.” Participant 7 mentions that prior to competition, he has the tendency to devalue his strength and capabilities as a lifter, which he cites as a source of stress. He is also “always” worrying about the amount of weight he will be able to lift, and if

he will be able to do so (an indication of the *post-training blues* phenomenon, which will be discussed further in latter sections). Powerlifters have also expressed the stress of overthinking during a competition, as indicated by participant 1 when he explains:

“if the weight feels heavier than you’re used to. Maybe first attempts if you know that they should have felt lighter, you know you’re not at your best at the meet, it can get stressful because in powerlifting competition is quite long, you compete in three lifts and if you don’t perform well on the spot, sort of black thoughts come to you; you think to yourself, ‘oh I’m not going to perform well now.’ And it can effect your performance in your other two lifts a lot if you can’t control it.”

Here, participant 1 gives an example of the thoughts he will have when he finds himself overthinking about how his first attempt went, and why the weight felt heavier than it should have. He cites this as a source of stress because in an event as long as a competition meet, negative thinking and overthinking can produce doubts of your true abilities and strength.

This thought also coincides with moments when athletes would feel they are having an off or difficult day, which they cited as a form of stress primarily during the training and competition phases of the season. In the same quote by participant 1, his sense of having an off day is demonstrated when he says he knows he is not as his best if the weight feels heavier, which he views as a source of stress when he further explains how this off day can lead to overthinking and getting in his head. However, participant 2 also explains how an off day can produce a similar proprioceptive sensation during training, stating:

“just the general fluctuation in your preparedness for each day. . . for example if I don’t sleep very well one night because I am up late studying or something like that, the training the next day, the actual weight feels heavier. As a result of the weight feeling heavier I kind of interpret that as me being weaker, rather than it just being somewhat of a normal fluctuation in how prepared I am.”

His off or difficult day, produced by a lack of sleep or studying, may result in him feeling less prepared, and in turn he may feel that the weight during a training session is heavier, and ultimately feeling as though he is inadequate. Participant 4 also admits that,

“if I’ve got a tough day I guess that would create a little bit of stress mentally later to try and keep in the head space of doing the big session ahead.” These difficult days may lead to less productive training sessions or competitions, due to the impact they may have on the psyche of the athlete. Ultimately, athletes may acknowledge that their off or tough days will sometimes lead to feelings of inadequacy; however, this may also result in them overthinking the significance of their feelings, and may blame it on themselves, when in reality it is merely a fluctuation in a typical day.

Powerlifters have also reported mental or physical fatigue as a source of stress throughout a powerlifting season. As a result of the regimented and physically taxing training programs these athletes undergo, they will often report feelings of fatigue and burnout. Participant 3 explains, “just start looking at your training log and you’re like okay I finished today and then this day this and this and this day. And just keep it on and on until the competition itself. So you know it just gets so draining. Every training session lasts 3 hours before.” As powerlifters progress through their programs, their training sessions will get longer and more intense. Participant 3 mentions his training sessions are three hours in length, and the repetitive nature of the programming can take a mental toll on his capacity to train efficiently. Participant 7 mentions that “last week when I was hitting my biggest lifts of the block, and by the weekend I was just in a dark corner somewhere because my body was basically destroyed.” These reports of mental and physical exhaustion make their one-week resting periods crucial for their health and performance in the competition.

Another source of stress that was frequently mentioned by powerlifters is social comparison throughout the season. These athletes will often assess potential threat in terms of competition standing. For example, participant 2 cited social media as a form of stress, as it allows him to monitor the progress of his competitors:

“Social media does play a part in the stressors for a powerlifting prep. Because you have the roster in advance, and so you know the names of the people in your class that are competing. And a lot of times, especially in a state like South Carolina where the population of powerlifters is somewhat limited. . . we all kinda follow each other on social media. . . so during the course of your conscious season, you’re exposed to what the other people are hitting, you seeing videos on Instagram of, ‘oh he just squatted this but I’m only squatting

that, 'so kind of an awareness that, of what your competitors are doing, as you're doing it puts on some additional stress and some additional pressure for you to perform in a certain way.'"

In reference to training for a competition, participant 2 explains how social media can be difficult for athletes because there is a constant knowledge of how their competitors are progressing before the competition. This may result in feelings of inability and inadequacy, as eluded to by participant 2. Similarly, in the pre-competition phase, participant 7 mentions he wants "to know if there's gonna be any competition because I like to win." Although such a quote can be seen as a form of coping, he cited this as a form of stress; if he acknowledges that there is, in fact, a threat to him winning the competition, it may result in a stressed response. Participant 1 explains this by saying, "I try not to bother too much with my competition, just to focus on myself. But of course if you see someone perform well in the gym on the training, it's a bit stressful for you if you are not at the level you want to be or if you see someone progress faster than you are." This stress continues into the competition. Participant 5 states, "if I've identified any other competitors as being equals in the competition, how well they're doing relative to my performance adds some stress. I guess the drive is there to beat them and to win." As the results of the meet unfold, athletes' desire is to win the competition. This will include pushing their boundaries, over-reaching certain lifts, and continually comparing their performances in order to ensure a quality meet. However, this process can be stressful during a day that is already exhausting. Participant 1 adds to this by saying, "If it's very competitive, if you fight for the win or second/third place, you're always looking at what your competition did and you want to beat it and maybe you push yourself too hard or your attempt selection is a bit heavier than it should be."

Feelings of isolation had appeared both inside and outside of powerlifting (exception: it did not appear in the competition time frame). For some athletes, most notably those who do not have many friends within powerlifting, often felt lonely and isolated. They emphasised that they did not mind, as it was a requirement of the sport. For example, participant 1 explains that, "maybe you can't do all the things outside powerlifting, like going out with friends or playing some other sports. It can get a bit lonely if you focus too much on powerlifting. Before major competitions it's the thing you have to do. It gets a bit stressful because of that." Here he illustrates that

powerlifters may need to make sacrifices in order to compete in powerlifting, because the focus needs to be maintained in order to be competitive. Additionally, participant 2 explains that, “there were sometimes when I felt, I guess lonely or like, I almost felt like I lived on a planet where no one understood the idea of wanting to achieve goals. Cuz everyone I was surrounded by didn’t seem to be ambitious or passionate about anything they just didn’t seem to really care about anything.” In this excerpt, participant 2 tries to explain that he preferred to be isolated from his peers, because they were not able to relate to his ambitions, drive, or goals. He preferred to be isolated as opposed to being surrounded by those he did not share anything in common with. In this athlete’s case, he knew he needed to have a significant work ethic in order to achieve his goals in powerlifting, and he has done so by maintaining his distance from his peers he could not relate with. Feelings of isolation often propagate to the personal life. Participant 3 describes the point in his life when he did not attend school or work, but was only training.

“I don’t go to school at that time, I don’t hang out with my friends plus like you know I won’t go out with my friends on like maybe Saturday night or something like that, everything I do I do it by myself at that time. Yeah it’s just. . . kinda feel a bit lonely when you’re doing that. Cuz as you know powerlifting is an individual sport so you do that by yourself.”

Participant 3 acknowledges that he feels lonely outside of training because he makes powerlifting his priority. It is a sport that requires individual training, and he demonstrates his willingness to make a social sacrifice in order to compete and perform in the sport.

Several other stressors were reported by participants, but excluded from the Table 2 summary. Nagging or phantom injuries/fear of re-injury, ensuring appropriate recovery, social media use, transportation, longer training sessions, preparedness, lack of equipment availability, finances, meet-related nerves and excitement, unknown variables/environment as it relates to competition setting, the length of the competition, sport’s impact on personal life and development, timing warm-ups in competition, family and friends as spectators, deciding attempts, not hitting their openers, gastrointestinal issues, and over-reaching for a lift in competition were all reported in various time frames during a powerlifting season.

### 5.2.1 Training stressors

When asked about stressors related to training in powerlifting, athletes most often reported an unexpected turbulence in schedule, or spoiled plans, as a source of stress. Participant 1 explains, “you always want to come to the gym and lift the weights you have planned to lift,” demonstrating that consistency in the powerlifting routine is important in order to make progress and reach expected lifting goals. When unexpected hassles arise that force the athlete to withdraw from their training plans, it is often stressful for them. In order for powerlifters to improve in their sport, they must lift heavier weights than other competitors. The sport of powerlifting is very objective in nature where results can be seen clearly and numerically – this requires a lifting program to be followed precisely. Participant 8 said, “if I’m training on a program if I don’t hit what I’m supposed to for that week, that would usually stress me out.” Competitive powerlifters must be disciplined in order to progress their strength, and if they do not, it can be stressful for them. Participant 7 further explains this when he says, “I’m working toward my goal of being one of the best in powerlifting... So like if I’m supposed to train one day and then something comes up out of the blue then I can’t go to the gym, that’s stressful to me.” Participant 6 reflected on his personal experience of when “life” would get in the way of competitive training. He said:

“That’s probably one of the reasons I’m not as strong as I used to be. So on the one hand, I enjoy training much more cuz it’s fun again. . . If I have to miss a workout because of life circumstances, I don’t dwell on it for the next three days. But at the same time I definitely make fewer sacrifices for training than I used to, so I think my performance isn’t as good as it could otherwise would be, but my mental state about it is a whole lot better than it used to be. There’s a trade off for me at this point. I know I could be a lot better than I am if I was willing to make some other sacrifices, put some other things on hold to take training more seriously. But I also know that I would be more stressed out now and generally wouldn’t enjoy life as much and wouldn’t enjoy training as much.”

Participant 6 has experienced both prioritising powerlifting and withdrawing from it in the face of life circumstances. He acknowledges that his performance would improve much more if he were to make it his priority, as were the case when he was at the peak

of his strength. His narrative is an indication of the extent to which spoiled training plans can impact a powerlifter's performance, and the importance of planning their routine.

Another often-reported stressor in the training phase is when athletes do not hit expected numbers/weight in their program. Participant 2 went into detail about this looming sense of expectation, saying,

“one of the big things for me in preparation for a powerlifting meet, would be the constant, kind of lingering of very objective, like, numbers I am planning to hit over the course of training, and the idea that if I don't hit those numbers, it's because I am not prepared enough for the meet, or I am not on pace with my goals.”

Often, powerlifters map out their entire year; they will decide/anticipate which meets they will compete in, and plan an 8-12 week training program based on the competition. This program is considered their competition season, with various fluxes of in-season, off-season training throughout a calendar year. Every training session has a purpose for ultimate progressions made and goals to be reached. Thus, when an athlete does not hit an expected number in terms of weights they were going to lift, this can be a source of stress for them, as it impacts their training program for the season. Often times, the sheer number of the weight to be lifted can intimidate these lifters, and can pressure them to wonder whether or not they are strong enough to reach their lift goals.

Participant 3 described this moment as:

“you're just looking at the program itself and you're like, okay how the hell am I gonna finish that? Like that is heavy but I have to do it with like so many times, no? And you're just lookin' at the program and it's like 5 sets of squat with like 6 rep of heavy weight, and am I gonna finish that today like?”

When the athletes get to a point in their training program that is high-intensity with heavy repetitions, it can become mentally and emotionally taxing, especially if they are not accomplished in a timely manner.

### 5.2.2 Pre-competition stressors

Competitive powerlifting is subject to an interesting phenomenon in the pre-competition phase that had arisen in the data. It appears to be fairly unique to strength-based sports,

due to the structure of a powerlifting program whereby athletes will typically end training one week prior to a competition meet, in order to rest for the meet. Participant 2 coined this phenomenon as the “post-training blues,” explaining that:

“At one week out, the stress is almost like a, it’s kind of like, you’re uncomfortable because you do not know if what you’ve done in the last 12 weeks is going to be enough to give you the results you want in a week. So it’s almost like you get the post-training blues, is what some of us call it, because everything is done and now you just kinda have to accept that everything over the last 12 weeks, you can’t change, and the results are gonna show in a week.”

These same sensations in the pre-competition time frame were described by 6 participants in total, and were coded as “post-training blues.” Athletes of other domains (e.g. aesthetics, contact sports) may experience worry about whether they are physically prepared for competition, but generally these athletes can work on their skills and technique without a one-week resting break prior to competition. In powerlifting, a training program is planned meticulously, and is made to be followed precisely. If all goes well, a powerlifter will train the way they planned for 8-12 weeks, putting all of their energy and effort into their lifts. A powerlifter will go through a rigorous high volume-high intensity portion that is usually structured towards the end of the program, further emphasising their need for physical rest in the one week to competition. The strength that they accumulate over that period is expected to show in competition through a series of lift attempts, and the uncertainty of whether they will be the strongest competitor can be a distressing thought. Participant 6 further adds to this notion by saying, “my general approach is do everything you can in training to put yourself in a good position on the platform. But when the meet is coming, there’s nothing you can do that’s going to make things better.” Post-training blues are a unique stressor to strength-based sports because the athletes do not know for certain whether their strongest lifts will be exemplified on the day of the competition. Their strength is not gained in competition; it can only be demonstrated from the work done in the training program. They are forced to accept that they cannot control their progress any longer; the outcome of the meet is now inevitable, and they must accept that whatever is going to happen, will happen. In a way, powerlifters face a discomfiting ultimatum: they are either strong enough to lift their competition attempts, or they are not. As participant 8 phrases it, he is typically “hoping that my body is peaked enough and

everything from the training went well.” They are forced to engage in a very passive process, as opposed to having control over the situation.

Another unique stressor to powerlifting, and potentially most strength sports, is making sure that the athletes have reached their body weight category on the day of the competition. The weigh-ins can be stressful for the athlete, as there can be a lot of uncertainty associated with the procedure. Participant 1 details his own reflections on the weigh-ins, saying:

“In these lighter weight classes like 74kg, if you want to be very competitive you usually stay a few kilos above the weight class and try to manipulate those last few kilos with water in the last week. If you’re not used to it, just seeing a number that is for example four kilos higher than your weight class on a scale everyday, it can get stressful if you know, ‘omg I am four kilos heavier than I should have been, I wanted to be comfortably in my weight class.’ So that is a part of stress you want to get used to because you will be seeing it all the time, and you don’t want it to effect your performance.”

Here, participant 1 demonstrates his awareness of the scale on his performance. He explains how this can be stressful for him, and what he does to ensure he does not have to go through this stress prior to his lifts. In the worst-case scenario, athletes will be placed in one weight category above. However, this puts them at a disadvantage when they are going through their lifts, because the other competitors in their weight class would be much stronger. Participant 2 further describes the uncertainty of making weight, explaining that it’s something:

“You just don’t know. You can bring your own scale, but you don’t know if your scale is accurate, or if it’s even consistent and reliable enough to tell you and there’s some normal weight fluctuations just like there’s fluctuations in how you’re feeling. And you don’t know if that day of the meet you might fluctuate up a couple of pounds, and. . . Either not being able to compete in your class, or having to rush and find out a plan on having to drop a couple of pounds in an hour.”

These insights on making weight are inevitable sources of stress for powerlifters and other strength athletes, as well as athletes in other contact/combat sports such as

taekwondo, mixed martial arts, boxing, etc. Understanding how to manage such stressors can be of significant help for powerlifters; this will be further discussed in the Presenting problems (6.2) section.

### 5.2.3 Competition stressors

Stress in competition was most often reported, having generated 21 codes. Participants often seemed to have much more to say regarding these performance stressors. Results of the meet was mentioned several times. Generally, participants will modify their attempts based on how the meet is going. Participant 2 explains:

“it’s really only that one lift that starts each movement that elicits some nerves, just because it’s arguably the most important lift of the meet, and missing that sets you back so much that you’re pretty much signing away your ability to perform at your best that day, because your most important lift was wasted.”

Here, participant 2 explains that the opening attempt of each of the three lifts is crucial, as it produces a psychological momentum for the remainder of the meet. The results of these openers can influence how the powerlifter will feel and how confident he will be for the remainder of the meet. Participant 7 adds to this by saying, “I find the first squat, the opening squat, the most stressful to me. Because it sets a tempo for myself for the rest of the meet. . . So when I get that first easy squat out of the way everything calms down for me. Then I can just kinda relax more.” While the athletes know that the first attempt is the easiest, there is a sense of relief and accomplishment in being able to execute the opening attempt. These emotional sequelae are important for the athlete to feel accomplished and confident, and if the openers do not go their way, the remainder of the meet may not go how they intended. Participant 4 also mentions, “as you get towards your third lift where especially on the last deadlift where you shoot for something maybe a little bigger than you can normally do, it’s stressful thinking about trying to make your attempts.” Here, the athlete demonstrates that sometimes, even if the results of the meet are in his favour, he may try to overreach in his last attempt. Thus, how the lifts unfold throughout a competition meet may influence the emotional and cognitive decision-making processes of the athlete, ultimately acting as a source of stress.

The importance of powerlifting on the athlete's personal and athletic life has also been recognised to be a source of stress for the athlete. When participant 3 spoke of his experience at the World Championships, he said, "I'm so scared of like, I trained two years for this thing, and now I'm here and freaking out a little bit." He felt the psychological weight of his hard work and dedication to the sport, which had accumulated in the last 2 years, for a one-day effort. Not accomplishing his powerlifting goals had enticed feelings of anxiety within him. He further explains, "I just get on the platform, I wasn't mentally ready at all, and in my head I'm just thinking. . . I can't mess this up. Mentally I'm so not ready right now but I'm just gonna do it anyway." Participant 3 appears to get in his own head by continually thinking that he is not ready, further heightening his own anxiety. Similarly, participant 4 spoke of his experience at the European Championships when he sustained an injury several weeks prior to the competition. He explains:

"I was really close to being in the top 10. So my goal was to break the top 10 at the competition, and I knew with this injury that the chances of that happening were reduced, so I was trying to be really aggressive with the rehab, I was still trying to train which probably wasn't the best idea but. . . kind of the, I wanted the performance to be as best as it could, because it's so difficult to get to these international comps. I knew it might be my only year doing so, I really wanted to do the best performance I could."

It is evident here that participant 4 had set goals for himself when competing at the European Championships; they were so important to him that he risked his physical health and wellbeing in order to strive for his best results. When he says he was "aggressive" with his rehabilitation, and in mentioning the difficulty in accomplishing international recognition in powerlifting, it illustrates the impact this sport has on his personal life and his identity as a competitive powerlifter. These sorts of tendencies can influence how the athlete performs, and will be further discussed in the Presenting problems (6.2) section.

#### 5.2.4 Life stressors

Stressors have been categorised according to stressors of life and powerlifting stress. Life stress has been furthered divided into 'daily hassles,' and major 'life events.' Life events were initially separated into codes, but were merged as "life events" theme, as

most participants experienced unique events in their life. Major life events included: achieving a powerlifting goal, career change, attending family's/friend's wedding, graduating, becoming a home owner, an inspirational moment, getting married, moving out/moving to a different city, organising a major event, passing of a loved one, post-university planning (making life-changing plans). Figure 2 is a display of life stress results. Daily hassles are in the top half of the figure, and include school and work-related matters, fear of re-injury, a lack of sleep, and spoiled plans. Life events and feelings of isolation also accounted for life stressors.

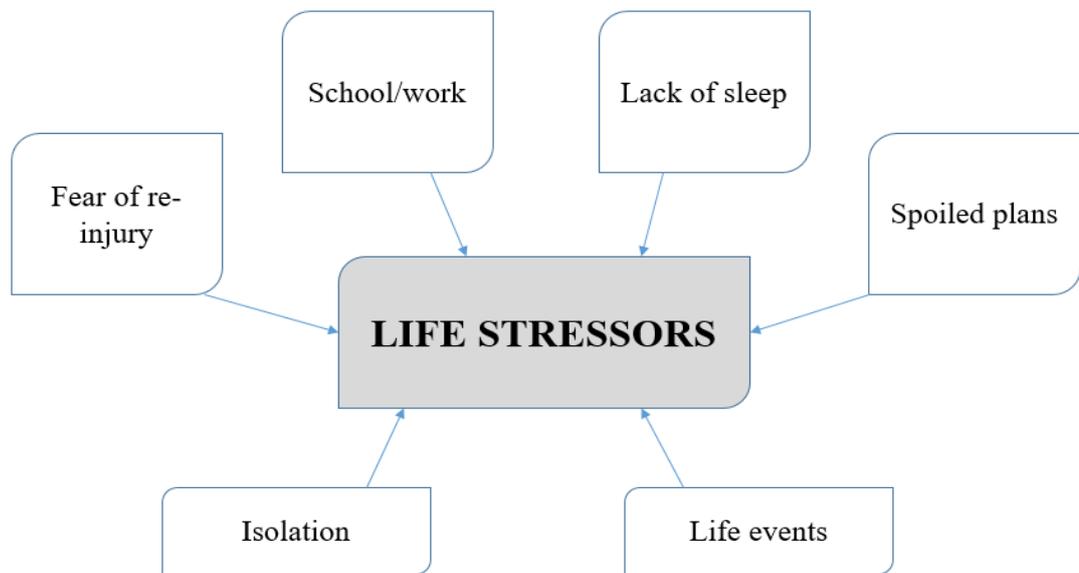


FIGURE 2: A display of life stressors experienced by participants outside of powerlifting.

Powerlifters appear to be detail-oriented individuals, as many of them have cited the importance of planning routines and schedules in their sport and personal lives. Thus, when life circumstances hamper their day's expectations, they often noted this as an annoyance in their day-to-day lives. Spoiled plans appeared as a stressor in the training phase of the season, but it was also considered a source of stress in the lives outside of lifting. Participant 1 explains that:

“what I hate the most is if I can't train in the hours I am used to. For example, if I have to be at college in the time I usually train, it's quite stressful for me because I have to get to the gym in the later time. I get home later, I can't go to sleep as soon as I would like, and the whole regime breaks down. I have to adapt training to it.”

Here participant 1 explains how a spoiled plan in one aspect of his life will impact his entire day. He mentions the importance of planning his training accordingly, so as to avoid this situation and stress from happening. Similarly, participant 2 says:

“If I find that I’m not getting enough sleep as a result of school, weird assignments that I stay up late for, or exam week, stuff like that, a lack of sleep does more negatively for me and my training than does any outside life stressors that really add up. . . I start to feel the physical effects of that in my training, and subsequently that adds to some stress because I know that I’m not performing where I should be as a result of something outside of training. And then that starts to be mentally stressful because there are other reasons outside of training that are causing me to sleep less, and so they’re kind of indirectly causing me not to train at my fullest.”

Participant 2 explains that not being well rested is a significant source of stress for him. However, it is when unexpected circumstances arise that would lead him to this poorly-rested state; a ripple effect is initiated and his plans are spoiled. In the spoiled plans as daily hassles code, other themes also emerged, such as unexpected circumstances with their significant others. Participant 2 spoke of an incident where his girlfriend’s grandfather was sick, and had taken a trip with her to see her grandfather before he passed. He said that, while this was something he was happy to do, it was a source of stress as it forced him to rearrange his training schedule and plans even though he had his competition in the following weeks.

Additional daily hassles were work- and/or school-related. This was eluded to in previous excerpts, but was also treated separately because certain work or school stressors do not pose threat to the daily routines of the athletes, but are nonetheless stressful for them. Participant 5 explains a particular incident with his co-worker, saying that it “created some stress during the work day. And then in the training session it was difficult to simply just focus on training. I also thought that some of my energy levels were lower than they typically are probably. . . due to that conflict.” While participant 5 was still able to attend his training session, he was not completely focused on it because of his work-related stressor. Participant 8 acknowledges that “life happens, so I’ll get worried if my classes go too late. . . ” illustrating that distress can arise from school-related matters.

Some (n=2) of the participants directly mentioned achieving their powerlifting goals to be a significant occurrence for them (more athletes who mentioned it indirectly throughout the interviews), and a source of stress when these goals are threatened. After all, the participants are all competitive powerlifters, most of whom have often achieved substantial national or international ranking. However, it is interesting to note that only one participant cited reaching powerlifting goals to be a major life event. A potential explanation for this can be the unique circumstance of competitive powerlifting. Competitive powerlifters' efforts to become the champions of their sport does not equate to financial certainty, despite annual, globally-held competitions and a recognised governing body (IPF). Due to powerlifting's lack of status as a professional sport, it is not possible to make a full-time career from competitive powerlifting. Thus, powerlifters are in a limbo of deciding the extent to which to prioritise their training and competitions, all the while meeting the same competitive and physical drives as elite, professional athletes of other sport domains with minimal athletic recognition. To compare these stressors with professional athletes in other sport domains could be an interesting avenue for future research. One participant reflected on this by saying,

“It literally feels like I have no life at that time, other than powerlifting, you know powerlifting is the only thing I'm doing at that time. It was boring at that time, it was stressful, it literally feels like it's my work, which, I don't get any money from it, so it doesn't make any sense at all for me to do that at the time actually.”

Here, participant 3 states that to put so much effort, time and energy into a sport without financial motivation almost does not make sense, and can be very frustrating and stressful when work or school are not an obligation. He experienced a point in time when he was not engaged in school or work activities; powerlifting was his only focus, and he explained this to be a daunting task, as he often found himself overthinking.

The impact of powerlifters' major life events should also be noted here. An apparent stress-injury relationship emerges in half of the participants, whereby they experience a major life event before an injury event. For example, participant 1 sustained an injury two weeks before the World Championships. In the weeks leading up to the Championships, participant 1 was moving apartments, and his laptop had broken down. It is possible that the stress from these incidences – as well as the stress

from the competition date approaching and preparation for the travel, expenses, etc. – compiled to result in changes in typical physiological cuing. Likewise, participant 5 was moving to another city for his first career out of university when he sustained his injury. He noted that the job he obtained was conditioned on him passing several exams. These stresses, in addition to his mentioned stress of finding an apartment in the new city before he made the move, could have had a similar impact of accumulating to the point where his typical attentional awareness may have been clouded, leading to an increased likelihood in sustaining an injury.

### 5.3 Coping behaviours in powerlifters

Tables 3 & 4 have been generated to list the codes of coping by powerlifters in stressful and injury events. The tables also provide the coping category according to Lazarus and Folkman’s (1984) and Roth and Cohen’s (1986) coping literature. The categories were assigned based on the context of their respective coping strategies, and may be indicative of the coping styles used by athletes in powerlifting. This will be further explored in the Discussion section. Frequency represents how many times the code appeared in the data on separate occasions.

#### 5.3.1 Coping with stress

Table 3 represents a summary of how athletes have coped with stressful circumstances. Codes are categorised into broader themes of problem-focused (10), emotion-focused (10), and avoidance coping (3) styles.

TABLE 3: Top 10 most frequently reported coping mechanisms in stressful circumstances by powerlifters.

Raw theme	Code	Frequency of code	Coping category
Making weekly routine	Planning/routine	13	Problem-focused coping
Programming his own training			
Having routine before each session			

Maintaining consistency  
even in the face of  
disruption

Re-planning after disruptive  
event

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Helping take burden off	Social support	11	Emotion-focused coping
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Constructive criticism

Workouts with friends

Providing understanding and  
empathy

Emotional support

Help to justify concerns

Maintain healthy habits

Attending meets

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There are things you can't change; life happens	"Outside of my control"	8	Avoidance coping
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Willingness to admit that  
some things won't go as  
planned

"You gotta do what you  
gotta do"

You do what you can in  
training. After that there's  
nothing you can do to make  
it better

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It's good to have other distractions in life outside of powerlifting	Interpretation of powerlifting stress	8	Problem-focused coping
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Can't live off of  
powerlifting; just a hobby

Stress = challenge; like  
playing a video game

Stress is inevitable

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Laser focus on life and powerlifting goals	Powerlifting as priority	8	Problem-focused coping
Dropping friends that have negative influence			
100% confidence in decisions made			
Nothing else in his life that would get in the way of competing			
Putting powerlifting at forefront of life and planning			
Forming lifestyle around powerlifting			
YouTube	Entertainment	6	Emotion-focused coping
Playing guitar			
Listening to music			
Skype			
Helps with warmups	Handler/bench coach	5	Problem-focused coping
Objectivity & focus			
Psych up the lifter			
Attempt selection			
Knows the lifter			
Loading the bar			
Hanging out with friends	Socializing	5	Emotion-focused coping
Chatting in the gym/meets			
Making new friends at meets			
Getting coffee			

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“Everything turns off” Not letting life get in the way of competitions Good at blocking minor stress	Ease in focus	4	Avoidance coping
Taking out negative energy through lifting Using training to maintain routine helps put mind at ease	Training as release	3	Emotion-focused coping

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Making a routine and planning was reported by all (n=8) participants, was most reported overall, and was determined to be a problem-focused form of coping in the stress context, because it attempts to reform the root of the problem. Planning, scheduling, and creating a routine allows athletes to feel that they have control over their life, even if they may not. This control allows them a sense of comfort and consistency in life. Participant 5 explains this when he says, “I found that continuing to train has been a really large component of how I’ve dealt with these stressors. I find that if I can continue to go to the gym and train, stick as closely to the plan or my training program as I can, it helps to put my mind at ease.” Thus, when unexpected hassles arise and induces a sense of stress, planning will force athletes to regroup and plan once again based on the events that have come up. This can be seen in their day-to-day life, as well as in competition. Participant 1 explains how “having a routine from week to week should be established. I would have like to established that at all times, not just to have it scheduled differently each week.” Here, he demonstrates that by having a schedule, it allows him to ensure that his plans are similar from one week to the next. This allows him to anticipate any potential threats to his life and powerlifting. Participant 4 demonstrates his effort to plan his training even in the face of stress when he says, “if I am distracted for a couple of hours, I guess as we get towards the training dealing with the stress, taking time to just to relax beforehand, maybe have a coffee, chat to some people in the gym, and then get to warming up.” Here he clearly establishes his routine prior to training when his day does not go as planned: his tendency to socialise with peers/friends, have a coffee, relax, and then get into exercises and warming up for the session ahead.

This high regulation of life circumstances closely relates to prioritising powerlifting over other aspects of their lives. For example, before participant 4 went into detail regarding his pre-training routine, he also mentioned that “training and competing is a massive part of life so, it’s a massive priority, so I would always find a way for it to become the main focus.” He explains that by having powerlifting as his main priority in life, he is able to assume such control in his personal life, and is better able to regulate the unexpected events that may threaten his priorities. Powerlifting as a priority is categorised as problem-focused coping, because it allows athletes to generate solutions regarding the problem through prioritising. Similarly, participant 7 demonstrates this when he states, “I try to form my lifestyle around training and that. So I try to make sure I get enough sleep that I eat enough and if I don’t get that then that’s kinda stressful in my mind because I’m working toward my goal of being one of the best powerlifting.” By prioritising powerlifting, participant 7 ensures he is well-nourished and rested for his training. If it does not go as planned, he assesses this as a threat to his goals, because his priority is being questioned by external factors. This also closely relates to employing distraction as a means of coping in stressful circumstances. For example, participant 6 tries to explain that he “just lived and breathed it, and if stuff happened that kept me from training or just anything like that, I dealt with the stress really poorly, like blew it out of perspective it was again probably my number one or number two priority at the time.” He went on to explain that training became more fun for him when he did not prioritise it, although he also attributes his lack of prioritising to him being weaker, not being as competitive any more and generally not performing as well as he used to. This notion is complimented by similar views from different perspectives. When asked if he had any final thoughts before the end of the interview, participant 1 adds:

“I think in a perfect world, you are a competitive powerlifter and you don’t have to do anything else in life, you just have to train, think about powerlifting and that’s it. But I think it can be counter-productive. It is good to have some other things to your life, for example having a job, attend college or classes, things like that, because it helps you forget about powerlifting for a moment. It gets the burden off your shoulders. Because you’re not under the pressure of trying to improve and beat others all the time. You find yourself in different situations in life when you’re, for example in a job you’re working with a team, you try to. . .

I don't know, it's just the whole world is trying to improve, and you're not competing against anybody, and you tend to get more relaxed because of those things. If you just stay at home all the time and think about how I'm going to train today, and then your training is not as good as you want it to be, it can really effect your mind set."

This compliments participant 6's views on prioritising powerlifting, as they both explain the importance of having other aspects of life balanced with each other. A more balanced approach in life allows athletes to experience pleasure, relaxation and enjoyment outside of powerlifting. Participant 3 also supports this perspective from a time when he was only powerlifting. He says, "That's how my life is like. And it's just it just turns to so draining to a point, it literally feels like I have no life at that time, other than powerlifting, you know powerlifting is the only thing I'm doing at that time. It was boring at that time, it was stressful, it literally feels like it's my work. . ." He shares his experience of only powerlifting when it was his priority in his life, and explains that when it was the only thing he was focusing on, the pleasure usually associated with training fades, and "feels like my work." He contrasted this to when he went back to school and said:

"now it seems better cuz I start hanging out with friends and this and that, and I walk to school so I was maybe talking to more people having more social life I guess. I feel a lot better and I think that's helps my training go better. . . on a mental level I feel a lot happier when I go to school, I get to hang out with friends and this and that, so I think it's better cuz I feel better when I go to the gym even though I feel a bit tired."

Ultimately, if athletes are to be competitive and high-ranked in powerlifting, the sport and its respective training must be a priority in their life, but this may be forced athletes to sacrifice other aspects of life, such as the pleasures of socialising.

Another frequently mentioned coping mechanism in stressful scenarios, which opposes the planning/routine habits coping, is when athletes adopt an "it's outside of my control" framework, categorised as avoidance coping. Participant 8 explains,

"I'll just kinda understand that it's life and life happens and you can't always have like the perfect time to go into the gym and get your training session in and

spend as much time as you need to do everything you need to do. So I would have that realization and get over it pretty quick, and just adjust where I have to.”

Participant 8 has the opinion that often times he cannot control external circumstances that will influence life’s plans. He demonstrates a sense of making peace with his inability to exercise such control, and will adjust his schedule accordingly. His experience is also interesting, as it demonstrates both the problem-focused means of planning his schedule, and adopting a passive mindset. The idea that outside forces cannot be controlled is in essence an avoidance mechanism, because the athlete removes himself from the situation/problem. However, the athlete will still attempt to control the situation by adjusting his schedule to the stressor at hand. As participant 8 demonstrates, if something comes up, he will just re-group and “adjust accordingly,” continuing to implement his planning/routine coping strategies. This frame of thinking is also seen prior to competition, and is known as the *post-training blues*. As expressed by the athletes, it is in reference to a unique combination of emotions and stressors that are associated with the one-week timeframe before a meet, and usually includes the sensation of life being outside of their control. These athletes demonstrate through their experience that “things aren’t going to go as originally planned, and being flexible is probably the biggest thing” when coping with such circumstances, explains participant 2. Powerlifters at some point will be forced to accept that “there are things in life that you cannot effect, and they just happen” (participant 1), whether it be prior to competition or when planning their training. But as a consequence, they also must be able and willing to make amendments in their routine or schedule where appropriate.

Other coping mechanisms deployed in stressful circumstances were reported by participants, but excluded from the Table 3 summary. Adjusting training, having a relaxation week, analysing and debriefing training sessions, distraction, having sources of inspiration, school/work, avoidance, honesty, gaining perspective, having light openers for competitions, napping and walking during meets, and spiritual faith were also reported as means of coping when athletes feel stressed.

### 5.3.2 Coping with injury

Table 4 represents a summary of how athletes have coped with injury circumstances. Problem-focused coping appeared 5 times, emotion-focused coping 5 times, and avoidance coping 5 times.

TABLE 4: Top 10 most frequently reported coping mechanisms in injury circumstances by powerlifters.

Raw theme	Code	Frequency of code	Coping category
Can be a long process	Finding appropriate practitioner	11	Problem-focused coping
Chiropractor			
Sport/physical therapist			
Massage therapy			
Online consultations with practitioners			
Family doctors			
Regular coach to help maintain powerlifting goals			
Acupuncture			
Appointment for cortisol injections			
Searching internet, books			
Knowledge through university major			
Learning from rehabilitative practitioner			
Proper mechanics and injury prevention			
What caused the injury			

Rehab exercises right at pain threshold	Adjusted training	8	Avoidance coping
Gradually increasing training volume			
Changing movement patterns depending on nature of pain			
Bodybuilding style of training			
Training movements that don't impact injury			
Training movements without pain			
Avoiding pain	Avoidance	8	Avoidance coping
Avoiding admitting injury occurred			
Avoiding making injury worse			
Avoiding proper time for healing/rehabilitation			
Didn't take pain/injury seriously	Denial	6	Emotion-focused coping
Surrounding circumstance & upcoming meet encouraged denial			
Lack of knowledge about mechanism of injury			
Injury event = attack on personal identity as powerlifter			
Could be worse		6	

This will make me stronger	Gaining perspective		Emotion-focused coping
Only a few more weeks			
Going through injury and rehabilitative process brought hope, healing			
Perspectives on mechanism of injury			
Encouragement from practitioner	Social support	6	Emotion-focused coping
Workouts with friends			
Help to justify concerns			
Provide perspective			
Maintain healthy habits			
Sharing similar experiences			
Athletes who came back from injury	Sources of inspiration	4	Emotion-focused coping
Knowing worse has happened to others			
Verbal encouragement			
Making process in rehabilitation			
Resting injury dependent on nature of injury	Interpretation of injury	4	Problem-focused coping
Training while injured helps maintain focus			
Allows time to learn about your weaknesses			

Rest is best for long-term physical recovery

Dissociating yourself from your injury

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Movies with happy endings

Entertainment

2

Emotion-focused coping

YouTube

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When injured, powerlifters engage in more avoidance coping when compared to other stress events. Such avoidance coping mechanisms include adjusting training in accordance with their injuries, and avoidance, but also taking time to learn about their injuries, and to gain perspective. It should be noted that athletes deployed more “gaining perspective” coping mechanisms when they were injured, versus when they were occupied by other stressors. With such management of stress, powerlifters’ attempts were to perceive their injury in ‘the grand scheme of things.’ For example, participant 1 describes:

“If you compare it to some major injuries, if you’re involved in a car crash or things like that. Sometimes you have to look at it from a different way, and think about, ‘maybe these few weeks will help me and I can perform better after that and it’s not a very long time in the sense of training if you’ve been training for a few years.’ 6 weeks is nothing.”

Here participant 1 attempts to explain how cognitively reframing an injury circumstance can help in many ways. In his case, it allowed him to notice deficits in his mechanics and improve training in the future, and it gave him a broader perspective of time. He also compared it to worse accidents (e.g. car crash), and eluded to an appreciation for his injury not being worse than it is. In this manner, he gained perspective of circumstances outside of his own, compared his experience and was able to regulate his emotional toll on his initial injury appraisal. Similarly, participant 2 explains how being marred by injuries led him to think, “I just ruined my back for my whole life, and not only did I stop myself from competing, now maybe I’ll have back pain when I’m 50 trying to pick up my 5-year-old child, or whatever.” The injury also led him to renewed hope, as he explains:

“one of the big things with [practitioner] was, ‘let’s educate you on how to better deal with this injury, and get rid of some of the psychological. . . almost like scarring, that’s associated with major injuries in people that are invested in some athletic endeavour.’ And so, at that point having met [name of practitioner] the physical therapist, I slowly started to become more hopeful that, ‘hey maybe this isn’t going to be something I deal with forever. ’”

Participant 2 mentions how fortunate he feels to have had so much help from his physical therapist throughout his rehabilitation, because he was a source of enlightenment and hope at an otherwise dark point in his life. He spoke of worries that his injury would be a lifelong battle, but his practitioner was able to help him gain a different perspective in order to erase the “psychological scarring” he was associating with it. Gaining perspective – a broader and more general term – was not always considered cognitive reframing, which eludes to participants’ active engagement in the reframing process. Most of the time, participants were in circumstances that altered their view of their own circumstances, ultimately gaining a sense of hope, without actively engaging in the reframing process. Thus, the coping mechanism demonstrated by powerlifters is more along the lines of “gaining perspective” through various events.

Additionally, powerlifters wanted to learn about their injuries, a problem-focused style of coping. Learning about the injury can be understood as powerlifters whom learn about the biomechanical, physiological antecedents to injury, how to fix the injury, how to prevent injury, and so on, through various third parties, such as their physical therapists, or reading articles/books about the injury. This ultimately led athletes to engage in various forms of rehabilitative exercise. When explaining his rehabilitative process, participant 4 says:

“It wasn’t a full diagnosis but it was wrong. So I continued to do kind of soft tissue work on the bicep that didn’t improve the situation, I’d have a weak coffee, low bar squat again and it’d be very painful. And eventually realized it was due to like a mobility or movement restriction so then it was a lot of trial work on flexor, tricep extension and trying to work on shoulder mobility. . .”

While he did engage with several sport therapists during his rehabilitation, he eludes to the process as more of a trial-and-error in terms of diagnosis and rehabilitative exercises. Learning through misdiagnoses can be a strenuous and frustrating process for

athletes, but participant 4 nonetheless demonstrates a knowledge of the exercises he must do for his shoulder injury, and what was the root of the injury to begin with. In addition, participant 2 explains:

“over time just becoming just a bit more physically capable of returning to things like squatting, and deadlifting. Slowly but surely I found myself in less pain, better awareness of my body mechanics, and on how to control certain lifts, how to breathe, how to prevent injury, how to warmup, all those types of things that go into injury prevention over the course of ... 5 or 6 months that I worked with [name of practitioner].”

Participant 2 details his experience with rehabilitation and how the process allowed him to gain understanding of how the human body moves under load, what he can do to prevent future injury, how breathing techniques impact lifts, etc., while experiencing positive outcome such as being “in less pain.” He also explains that before the injury:

“I didn’t understand what intervertebral discs were made of, and what the annulus was, and the mechanism of injury like I do now, that at the time I thought, you know, to me it was like, oh I sprained my ankle like I did when I was a kid, and it’ll be fine if I just give it rest, but I’ll just rest when the meet is over. I didn’t kind of grasp the potential, long-lasting and serious negative effects that would come from training through that injury.”

His appreciation for his new knowledge advances are evident as he details the contrast of his past ignorance with what he has learned from his injury circumstance. Similarly, participant 5 explains that with the help of his injury practitioner, he was able to, “address the injury mainly through modification of exercises and I guess therapeutic exercise in the sense of using what I was already doing in the gym and modifying it to stimulate or encourage tissue healing.” He learned to modify his exercises when engaging in further training, and was ultimately able to undergo rehabilitation for his injury on his own.

Such coping strategies are in contrast to several avoidance coping mechanisms powerlifters have utilised, including adjusting their training according to injury. Approximately half (n=4) of the participants have made use of adjusting their training according to the limitations of their injury. When athletes would detail their

rehabilitative processes, they mentioned they would still ensure rest for the injury, but continued their training program as otherwise anticipated. Broadly speaking, this demonstrates avoidance because resting the injury is avoiding the mobilisation of the injured area; escape from the injury (problem/stressor) is occurring. It should be emphasised that not all avoidance coping mechanisms are considered maladaptive processes for the athlete. Participant 1 details his experience with adjusting training during injury, when he says:

“I trained all of the movements I could without pain. With the back injury, I did a lot of volume for upper back on the exercises. They didn’t stress lower back, a lot of pull-downs, chest-supported throws, leg extensions, I trained a lot of machines. For knee injury, I couldn’t train legs of course, but I could train stiff leg deadlifts, bench press normally. . .”

In this manner, powerlifters are capable of working through their injury stints, although not implicating pain or aggravation to their injuries. Powerlifters will adjust training by engaging in exercises where injured muscles act as secondary movers or as stabilisers. By continuing in their training programs without further injury or harm to already-injured areas, athletes are capable of remaining connected to the sport. Participant 1 goes on to suggest:

“When you deal with such injury you should keep training the movements you can because it keeps you focused. You don’t lose your focus and getting better. You can even actually find something positive in these injuries, you can work on weak points, which you may not normally do if you’re not injured and if you just trained like you normally do. While taking time off from movements you can’t do because of pain, you can actually improve things with the other movements, and it can help you in the future.”

In this way, participant 1 explains that by adjusting your training and continuing the program, powerlifters are capable of maintaining focus for the competition ahead, and are able to work on movements or muscles they may not necessarily do normally. When athletes view their adjusted programs in this manner, it can certainly be considered a problem-focused means of coping. This perspective is similar to participant 3’s when he says:

“When I’m talking about rest I’m talking about resting the area that you injured. So if I’m talking about my wrist, what I’m gonna do is I just don’t do anything that’s gonna stress my wrist, and what is gonna stress my wrist? Probably the low bar squat, and like bench press, these two lifts are gonna stress my wrist a lot. Just now I’m training more bodybuilding style, maybe for the chest because I’m not doing bench press now so I can’t train my chest, so what I’m gonna do for the chest is make cable crossover. Yeah I only do cable crossover for chest but like other body part maybe I do cable machine work, and more dumbbell work, more work that doesn’t put direct stress onto the wrist itself.”

When participant 3 experiences injury, he will avoid holistic rest, and will just avoid movements that target his injury. He also explains that he not only adjusts the exercises, but also adjusts the volume of weights, intensity, and number of repetitions and sets when he says he engages in “bodybuilding style” upon injury. He did this as a means of continuing his training in the face of competition. Participant 4 also mentions how during a minor injury, he had to “switch to a close-grip bench press, and I did majority of my work with a high bar squat, instead of a low bar squat. So that was a very informed process because it was uncomfortable but it never stopped me from training.” Powerlifters will do what they can in order to continue their training programs. Due to their tightly-timed training programs, there is little room to afford time to completely rest an injury, although they still report resting injury to a certain extent.

Avoidance tendencies were also heavily cited throughout analysis, naturally being categorised as avoidance coping. Early in his career, participant 6 explains how he coped in injury situations. “Very early on I dealt with injuries poorly. Um, didn’t rehab them sufficiently, tried to get back into training before I was ready to and tried to progress loads much faster than I should have.” Insufficient rehabilitation of an injury and returning to play before proper recovery are indications of avoidance coping. Participant 6 here avoided proper rehabilitation because he denied the threat to his personal identity, as he explains when he says, “I wasn’t in a place where I could not go hard for several months at a time. [Powerlifting] was such a big part of my identity, I felt compelled to train hard if my body would let me. Sometimes even if my body wouldn’t let me.” He viewed injury contexts as a threat to his identity; he so strongly identified as a powerlifter that he “could not go hard for several months.” He did not want to face the emotional conflict of losing his identity, so much so that he preferred to

avoid the injury altogether. Participant 4, who was injured close to a major competition, expresses his decision-making by saying:

“I was placed 11<sup>th</sup>, 4<sup>th</sup>, 12<sup>th</sup>, and I was really close to being in the top 10. So my goal was to break the top 10 at the competition, and I knew with this injury that the chances of that happening were reduced, so I was trying to be really aggressive with the rehab, I was still trying to train which probably wasn't the best idea but... kind of the, I wanted the performance to be as best as it could, because it's so difficult to get to these international comps. I knew it might be my only year doing so, I really wanted to do the best performance I could.”

Sustaining an injury so close to competition was a difficult time for him; he wanted to achieve his goal of doing well in the European Championship to the point where he put his health at risk. He avoided pulling out of the competition and resting his injury, and decided to pursue training with more intensity to achieve his goal. Participant 2 also reflects on his injury when he says, “I kind of... ignorantly let myself train for over a month, it was really like 6 weeks, whereas maybe if I had dealt with it 6 weeks ago I could have still competed had I done it more intelligently.” Upon his initial injury event, participant 2 continued his training program, until the injury worsened. He cited this mistake as an ignorant moment, assuming the injury was minor and did not need proper rest. Ultimately, he made the decision to avoid rest, continue training, and came to recognise the consequences of avoiding proper rehabilitation by reflecting on the likelihood of a more catastrophic injury occurring if he had been more intelligent about the event. Powerlifters will tend to avoid resting injuries when they have a value threatened, whether it is their pride, an important competition, or personal identity. Sometimes the athletes had to avoid movements that caused pain outside of the powerlifting context. Participant 7 describes, “Like even for day to day stuff I couldn't pick anything off the ground properly cuz I was always having my hip twisted and stuff.” He explains how when he initially sustained his injury, he was in so much pain that he “laid around for, well it seemed like a month.” His pain forced him to avoid movements in his day-to-day life as a means of regulating his threshold to pain and the emotional responses he had.

Other coping mechanisms in injury events were reported by participants, but excluded from the Table 4 summary. Taking time to rest, distraction, training alone,

school/work, and being forced to push through pain for school or work were other reported coping mechanisms by powerlifters when dealing with injury.

#### 5.4 Sources of social support

Social support was an important theme that was explored in this thesis. It came up naturally when participants were asked about how they deal with life, injury and powerlifting stress, and it was expanded on when athletes were asked about the sources of their social support. Cited sources of social support in powerlifting include family, significant others, friends, practitioners, fellow powerlifters, coworkers, and coaches. While some athletes experienced sources of support from one group, others would express their lack of support from the same group. In contrast, some athletes would express both support and lack of support from the same group depending on the context of their stressor. Social support was utilised to a greater extent when powerlifters experienced life and powerlifting stress, as opposed to when they had injuries. In Table 3, two seemingly similar means of coping are displayed; however, differences appear to exist based on athletes' narratives. *Socialising* refers to when athletes would reach out to their friends to be physically in their presence, and would engage in social activities as a source of uplift and enjoyment. For example, participant 6 would socialise with other competitors during meets in a light-hearted and fun manner. He details a typical routine from competitions when he says:

“between attempts, while everyone else is back in the warmup room like you know, fidgeting stretching getting light reps with 16 kilos to stay loose or whatever, I find people to chat with catch up with, um, so like for example, at my last meet, the couple of the guys from the gym were there and we were joking about how they should make a vasodilator like, in a pre-workout where instead of using citrulline or arginine, something that works but not all that well, they should find a way to slip Viagra into it because it's probably the best vasodilator in the market. So general small talk like that between attempts.”

To relieve the amount of free time between attempts, participant 6 prefers to engage in banter with fellow competitors. His enjoyment in the particular moment with lifters from his gym was evident as he laughed when telling this story during the interview. His use of socialising as a coping strategy in competition settings is evident here, as he

uses it as a source of joy in order to maintain laxity in his competitive state, and his use of contrast and comparison to demonstrate how other competitors “fidget” and “stretch.” This contrast illustrates how he prefers to remain relaxed and composed, when others do not, thereby directing his coping towards socialising. Participant 7 says, “I make friends along the way [of the competition], so there’s always someone to talk to,” illustrating his preference to socialise during competition in order to create an environment that is “pretty loose and relaxing” for himself. Participant 3 also describes his engagement with friends when he says, “I start hanging out with friends and this and that, and I walk to school so I was maybe talking to more people having more social life I guess. I feel a lot better and I think that’s helps my training go better.” Here he describes how training has been a much more positive experience for him when he had a well-balanced lifestyle that included socialising via “hanging out with friends.”

*Social support*, on the other hand, refers to times when athletes would receive or seek emotional support from their respective networks when they are troubled or in need. This is displayed when participant 4 describes:

“because one of my work colleagues are relatively into, not powerlifting they’re into strength training or they at least have a general interest in strength and conditioning, so they’re supportive when there’s no kind of, the usual kind of people... if you go out with friends, the pressure to try and eat badly or trying to make you drink, they appreciate that you’re in competition and so they’re not trying to give you 6 pints of cider on a Saturday night. So that’s helpful. Family is supportive, they uh... my girlfriend’s supportive. So that’s quite easy. The main one I guess is my friends are very into the same thing, we both got a similar kind of schedule as well with competition that helps, and while they do need solo, a single competitor, to do it as a group definitely helps.”

For participant 4, having friends within powerlifting or the realm of strength and conditioning “definitely helps” him; they are all familiar with competition requirements, they do not pressure him into “trying to make you drink,” and they all have a similar schedule and overall routine. He describes this as his “main” form of support. He also mentions that he feels supported when they train as a group despite powerlifting being an individual sport. Participant 5 describes how he receives support from his family and friends, despite their lack of knowledge in powerlifting.

“So they can’t help with regards to the specifics of the sport but they are certainly willing to lend or to give emotional and mental help and they’re usually very supportive to get better in the sport of powerlifting. And I do have some people in the support network that are powerlifters themselves so they’re able to give help.”

For him, it is important to receive the emotional and psychological relief his family and close friends are able to provide, while also maintain close relations with powerlifting colleagues who are able to provide a different kind of support through critique and encouragement. In terms of the support he receives from his powerlifting colleagues, he says in another excerpt:

“They are there to tell me when I am being silly, and when maybe my concerns or worries are rational or irrational. Um. And also provide some perspective. So it’s happened on a number of occasions where one or two of my friends in that social circle have heard me voice some of my concerns around how a particular training session or training cycle has gone, and they’ve been the one to say, “yeah it’s not great, but if you’re gonna look at where things were a few months ago you are much better now than you were then. And if you look at how training on the whole has gone, that was just one hiccup really. It’s not that big of a deal.” Um. So they lend perspective that way. And um. Then they also offer some constructive feedback quite often where if something isn’t feeling quite right, usually these people who are offering this feedback are present in the gym, so they are able to see me as I train. So from having issues with something, they might be able to offer a piece of advice around, ‘maybe you should try this cue, or maybe you might consider changing this variable,’ um. Yeah. So, so trying to provide other solutions to whatever problems arise.”

Participant 5 stresses the importance of his friends within powerlifting as being able to provide him consolation when his technique is off, or when he does not feel well about his progress. He is able to gain perspective and reframe his own thoughts through this form of support.

Another interesting means of coping was the integration of a handler or bench coach in competition settings. At least three of the athletes mentioned that they have a handler. The role of a handler is best described by participant 5 when he says:

“Having a basic understanding of how a lifter is, how they handle certain variables in context of training or performance, and they should also be involved in the creation of the attempts, attempt selection plan on the competition day. And they often help in the warmup area, load the bar, see how the lifter is moving, how well they’re executing. Maybe give a couple of pieces of advice for technical modification. But more than anything I think they’re there to observe and then to give feedback after each attempt to facilitate with best overall performance and to avoid things like bombing out for instance.”

In a way, having a handler is also a source of social support, as they are an individual that the athletes can rely on during competition. However, unique traits exist about a handler versus other sources of social support. Handlers tend to be a friend who is also a powerlifter, and are competition-specific coping mechanisms, as powerlifters only need the assistance a handler provides in meet settings. They usually know the athlete well enough to be able to suggest attempts based on a strategic blend of their natural ability, and how they are performing that day. By having a handler, athletes may feel more assured in avoiding *bombing* out, which is when the athlete fails all three attempts in any lift, thus disqualifying him from the competition. Powerlifters who have handlers will also say they “will help me psych up as well, for big lifts. He would know what to say or do to help me keep focus” (participant 4). Participant 1 states that his handler helps him “with warm-ups and to be objective about how my lifts look like.” Handlers ultimately provide support many other sources cannot: maintain objectivity in the competition setting while also maintaining the athlete’s enthusiasm and energy, and helping select attempts with careful consideration of all factors involved. Athletes who do not have a handler would often state selecting attempts as a competition stressor (Table 2). For example, participant 8 mentioned attempt selection as a source of stress, and went into detail of what he goes through during a meet when he says:

“Picking the right attempts during meet day; I never have a handler I do it myself. So once you get the lift you have to run over to the table and tell them your next lift. And I always like, it’s a little bit of stress going through that, it’s not a panic, but there’s a little bit of anxiousness getting that out of the way so you can focus on the next one.”

He describes how going through the attempt selection process can be anxiety-inducing, as reporting the selected attempt to the judges prevents the athlete from focusing on the proceeding lift. To support this notion, participant 1, who usually has a handler, was not able to have one when he went to the World Championship. He says, “for example, load the plates for warm ups, decide which attempts to put on, and it can get stressful because at the meet you should only focus on lifting weights and not about other things.” When athletes have other items to worry about in a competition, it can detract their focus from the lifts.

Not only was social support cited as a coping mechanism, it was also cited as a source of stress. It is interesting that when athletes did not feel well-supported, it was a source of stress; however, when they do receive that support, it was a means of coping for them. Especially interesting to note is that when athletes did not receive support from family specifically, it was only in the context of powerlifting. They said their family was usually supportive in other domains of life, but powerlifting was something they did not always feel supported in. Participant 3 describes how his parents, “apparently don’t really like me participating in my powerlifting, cuz things like, oh waste of time, this and that, that’s how Asian family works, you know how school this and that, you know so, it just adds so much pressure.” For him, there was an added external pressure from his parents, who he felt were not supportive in his powerlifting ambitions. His parents have shamed him for participating in this sport, especially his mother, who would see him “going to the gym, and yell at me ‘oh why aren’t you studying?’ and stuff like that and she would just start a bit of an argument with me every time, and it just wasn’t that fun I guess. And it can get in my head a little bit.” Because participant 3’s parents have not been a source of support for him throughout his powerlifting career, he felt the sport’s distressful impact all the more. Similarly, participant 2 felt his family wanted to support, but they failed to understand the importance of powerlifting in his personal development and for his long-term goals. He says:

“so during that first injury and one of the reasons it was so like psychologically stressful was because I didn’t really have anyone... I mean I had my parents who are very supportive and nice, but they don’t understand, they think lower back injury and they’re like, ‘omg you’re gonna mess yourself up forever.’ So

they're supportive in me doing what I need to do to be a healthy person not necessarily in me wanting to squat as much weight as I possibly can.”

When he was going through his injury, participant 2 explains that his parents were more so worried for his health as opposed to how the injury impacts his ambitions. His parents were more concerned about his wellbeing than exercising their empathetic capacities to understand the bigger picture. This indirect lack of support led him to feel more distressed than he would otherwise be if his need for support were fulfilled. Participant 8 explains, “I don't really go to like my parents to talk about it, cuz they don't really understand powerlifting. They'll usually say just, 'oh yeah you'll be fine, keep working hard.' But yeah nothing relatable enough.” He explains his parents' support as “not relatable enough.” His parents do not understand powerlifting; their passive words of encouragement illustrate a lack of effort to engage with him about his participation and competitions, which has led to participant 8 seeking support through other mediums.

## 6 DISCUSSION

The purpose of this thesis was to explore the stressors and coping mechanisms by competitive powerlifters in a sport injury context. These results point to similarities in both stressors experienced and coping mechanisms deployed in powerlifting when compared to athletes of other domains. When examining competition stressors, Mellallieu et al. (2009) described both performance (injury, preparation, expectations, self-presentation, and rivalry) and organisational stressors (facilities, weather conditions, format of competitive performance) in a group of elite and non-elite athletes. Anshel (2001) identified several acute stressors in Australian rugby players, including making a physical error, a cheating opponent, referee decisions, and experiencing pain. Stressors such as injury, rivalry, preparation and facilities are similar as those reported by powerlifters. Life stressors, on the other hand, is an umbrella term for the daily hassles, as well as the major life events the athletes have experienced throughout their powerlifting careers, with a focus on the stressors surrounding their injury circumstance. Daily hassles have been shown to have a significant effect on injury incidence (Ivarsson et al., 2013), including their initial baseline and the extent to which they change over a

soccer season. Such results are indicative of their importance on the moderating effect on stress appraisal and injury.

While injury can and is perceived as a stressor, it is treated as a separate variable as per the stress-injury model (Williams & Andersen, 1998). Hardy & Riehl (1988) explored stressors experienced by athletes in non-contact sports, and determined they were prone to frequent injuries when they experienced greater total life change and negative life change. By contrast, in a varied group of adolescent athletes including wrestlers and gymnasts, the stress-injury relationship was non significant in athletes who reported high levels of social support and coping skills. Their results indicate that the stressful impact of negative life events is cushioned in athletes who have coping resources and sources for social support available to them; athletes who do not have such resources have a greater exposure to injury in the face of negative life events (Smith, Smoll & Ptacek, 1990). More recently, Johnson and Ivarsson (2011) supported the notion that negative life event stress is a strong predictor of injury occurrence in junior soccer players. In this thesis, major life events were explored generally and in relation to injury incidence. The stress-injury relationship as it pertains to these results will be discussed further in section 6.1.

In order to understand the coping mechanisms employed in powerlifting, participants were asked about how they “deal” with stress and injury events. This was done in two separate questions; data was coded accordingly. Broadly speaking, *coping* refers to thoughts and actions that help athletes manage physically and psychologically taxing situations (Crocker, Tamminen, & Gaudreau, 2015). More specifically, *coping style* refer to an athlete’s disposition towards a preferred method of coping, regardless of the stressful situation (Anshel, 1996), whereas *coping strategies* can be viewed as constructs in the coping process (Anshel, Kang, & Miesner, 2010). Coping styles were categorised according to pre-existing macro-analytic styles of coping, as determined by context in which the athletes mentioned them. Assigning macro-analytic coping categories in this manner is indicative of the coping styles found in powerlifting as a sport; inferences can be made on the differences between powerlifting and other sports based on these results. Several interesting results emerged from data. Most frequently reported coping strategies in the stress context included planning and making routines in day-to-day lives, relying on social support, prioritising powerlifting over other aspects

of life, and adapting a mindset of life events being “outside of my control.” Planning as a coping mechanism in powerlifting is congruent with current literature, where Crocker, Tamminen, & Gaudreau (2015) report it as a frequent coping strategy used in sport contexts. Coping literature strongly suggests that coping as a mechanism is primarily situational; that is, athletes’ coping is not stationary by nature, as it fluctuates depending on circumstance (Nicholls & Polman, 2007). The results from this study support such a notion, as indicated by the stronger use of avoidance coping in injury circumstances, as well as the tendency to seek social support more frequently when stressed as opposed to when injured. Similarly, literature currently suggests that athletes may be more prone to injury if they both have low resources for coping and lack social support (Arvinen-Barrow & Walker, 2013). A study by Hoar, Evans, and Link (2012) reported coping mechanisms in pre-competition settings, which included more emotion- and problem-focused coping such as seeking social support and problem-solving. While their study was done with older master athletes, such findings are similar to those of powerlifters, who overall used more problem- and emotion-focused coping such as planning, entertainment, and having a relaxation week prior to competition. In addition, Gaudreau, Blondin, and Lapierre (2002) reported how coping strategies change across phases of a competition in golf. Their results include use of humour and increased effort in the pre-competition phases, as well as seeking social support, humour and venting during competition phases. Certain unique coping strategies exist in powerlifting, such as having a handler or bench coach as a means of avoidance coping in dealing with attempt selection, and a relaxation week to promote muscular healing; however, many similarities exist such as seeking social support, active planning/adjusting. It should be emphasised that due to the predicting nature of the stress-injury framework (1998), how athletes cope with life stressors is more indicative of injury occurrence as opposed to coping with injury. This distinction was necessary to be made in the data collection process.

Coping with injury has slightly differed from coping with life and competition stressors, both in literature and in these results. Perhaps a reason why avoidance coping is frequently reported in injury context as opposed to other forms of stress, is because injuries are viewed as more taxing of their available resources for coping. Powerlifters have frequently reported use of avoidance coping throughout their injury processes. Carson and Polman (2010) discuss the importance of avoidance coping in injury

circumstance, as it often helped athletes get through their injury rehabilitation. However, maladaptive avoidance coping was also reported in their rugby sample, such as binge-drinking. This type of avoidance coping is widely admitted in literature as detrimental for the athletes' future participation in sport (Carson & Polman, 2010). Binge-drinking was not reported in this sample of powerlifting athletes. In addition, Salim, Wadey and Diss (2015) suggest athletes high in hardiness are more likely to cognitively reframe their injury circumstance due to their willingness to seek emotional support through their social networks, an idea closely linked with the social support construct in this thesis. Powerlifters used emotion-focused coping often, both in stressful and injury events; even more so, they worked on gaining a different perspective when injured. Such results suggest these athletes may also be high in hardiness, a personality variable, and have often reported using social support to regulate their emotional outlets. Powerlifters have often depended on their family as a source of social support. This is in keeping with Petrie, Deiters, and Harmison (2014), who illustrate that support from family moderates life stress; thus, if an athlete has high life stress, support from family can mediate the deleterious effects of stress on injury outcome. In addition, Arvinen-Barrow and Walker (2013) summarise that athletes who simultaneously have high life stress and low social support are most likely to sustain accidental injury.

There have been several unexpected results, although they are still linked with Andersen and Williams' (1998) stress-injury approach. Personality characteristics appear to be an integral component to the model, as they inherently appeared in the data without participants being questioned about it during the data collection process. Trait anxiety has often been cited as a personality moderator in the stress-injury prediction literature. A study by Ivarsson, Johnson, and Podlog (2013) illustrates that injury risk is greater in professional Swedish soccer players with high trait anxiety. Similarly, junior soccer players with high somatic trait anxiety are more likely to experience accidental injury, as opposed to those who have low somatic trait anxiety (Johnson & Ivarsson, 2011). Similar findings were reported by Petrie (1993) when he reported high competitive trait anxiety as a correlate to sport injury. High trait anxiety may also influence injury outcome in powerlifters, as participant 6's high trait anxiety tendency eluded to his injury outcome. Achievement motivation literature is scarce since its initial proposal as a personality variable moderating the stress-injury relationship. It is

defined by Nicholls (1984) as meeting or exceeding an athlete's own drive towards mastery through exceptional performance when compared to others. Andersen and Williams (1998) explained that achievement motivation is common in sport and appears to be related to stress appraisal; however, this notion has not been well verified through research. It is difficult to understand the relationship personality characteristics may have on the stress-injury relationship from this thesis, as the purpose was not to predict injury and its psychological variables, but to further explore the variables through powerlifting athletes, and extrapolate on potential relationships within the stress-injury framework. Having said that, that the personality characteristics emerged as a variable without intent should not be ignored. Personality characteristics interact with the stress-injury relationship, as the participants often cited the way they approach stress and injury is dependent on their personality. If it exists in relation to coping mechanisms (as these results suggest), it is possible that it exists in relation to the decision-making processes such as risk-taking, which may influence the outcome of injury. Currently, trait anxiety (Ivarsson, Johnson, & Podlog, 2013) and sport anxiety (Arvinen-Barrow & Walker, 2013) are one of the few well-supported personality characteristics in its influence on the stress-injury relationship. Other personality characteristics should be explored, such as extrovert-introverted-ness. Perhaps powerlifters with extroverted tendencies have a certain disposition to risk-taking behaviour. Risk-taking behaviours, sensation seeking, and impulsivity are personality traits that have been linked with increased risk of injury (Paquette, Dumais, Bergeron, & Lacourse, 2016). This notion should be further explored in strength sports.

### 6.1 Stress-injury pattern

The primary purpose of the stress-injury framework by Williams and Andersen (1998) is to establish the predicting relationship between the stress response and injury incidence through moderating variables. Most literature points to a positive correlation between negative life stressors and incidence of injury (Johnson & Ivarsson, 2011), with history of stressors being the most validated moderator variable in the relationship. Throughout analysis of participant data, a potential stress-injury pattern was seen in approximately half of the participants. These indirect relationships are theorised in the cases of these athletes; however, literature supports these prospective notions. When athletes perceive greater psychological stress – whether appraised as a threat or a challenge – it may result in several cognitive and physiological changes, such as

distractibility due to an increased preoccupation with the stressor (Smith, Smoll, & Ptacek, 1990), muscle tension, and a narrowed peripheral visual (Johnson, 2004). These risks are associated with injury incidence through stress appraisal. When athletes are distracted by non-normative events in their personal lives, distressed appraisal may be enhanced. When muscles are more stiff and rigid, they are less prone to the usual adaptability of physical activity and may result in less flexibility and changes in muscle coordination (Kolt, 2004). Especially interesting to further investigate would be the influence of a narrowed periphery for strength athletes. The performance and lifts powerlifters execute are not directly dependent on external cues such as the weather, or the surface of the gym's floor. Athletes in other domains may depend on a particular surface for the football pitch, or weather conditions being favourable. Because powerlifters do not directly need these environmental cues, perhaps this impacts the extent of peripheral narrowing or distractible tendencies, and ultimately their probability for injury from a neuropsychological perspective. Conversely, the results of this thesis suggest that powerlifters may be just as at-risk to accidental muscular injury as any other athlete, even though they perform in a closed environment such as a gymnasium. It should be noted that this link could not be thoroughly explored, as it took into consideration major injury events and excluded minor injuries that did not need rehabilitation. Participant data suggests the probable stress-injury relationship as it unfolded through the data collection process; this also includes participants who experienced many accumulating minor injuries. The definition of *injury* in literature typically requires harm to musculoskeletal body part(s) that result in at least one day of discontinuation from sport (Ivarsson, Johnson, & Podlog, 2013; Petrie, Deiters, & Harmison, 2014). This was defined as *major injury* throughout this thesis work. Nagging injuries could potentially accumulate from stress.

In addition, a lack of reporting major competitions as life events in powerlifting can be a concern, as most of the participants cited sustaining major injuries prior to a competition. The stress-injury relationship may be influenced by the degree to which athletes view these competitions as major events occurring in their life, in addition to the infrequency of most competitions in a single calendar year. If powerlifters compete only once or twice a year, this may impact the degree to which they view these competitions as stressful; they may feel they have more to lose if it does not go as planned. If participants frequently reported stressors such as not hitting their expected

lift goals, mental and physical exhaustion, and overthinking about the training and competition, it can be speculated that the competition can, indeed, be appraised as a major event (whether it be with positive or negative psychological outcomes) in the lives of powerlifters, and its potential significant influence on the stress-injury framework. Further research exploring the stress-injury relationship in powerlifting and other strength sports is needed in order to determine the impact competitions have on stress appraisal and injury incidence.

## 6.2 Presenting problems: Sport psychology perspective

Several issues can be distinguished from transcript analysis. Some powerlifters experienced similar psychological consequences as athletes from other sport domains; however, it is essential to understand how to apply mental skills training catered towards powerlifters. Professionals working with powerlifters should understand the sport and its principal concepts, such as making weight for the athlete's respective weight class and associated stressors with this process, the type of diet powerlifters will consume in order to maximize their strength growth, the 'art' of choosing appropriate attempts in order to systematically and strategically reach an appropriate final attempt, and so on. Because powerlifters are organised, hands-on and time-efficient athletes, incorporating mental skills exercises into their already established powerlifting programmes can be a motivating way for them to try mental skills, without losing much time or energy in the process. It may also help them approach mental skills with an open mind. In addition, by implementing mental skills into exercises they already do, this may allow for a palpable and direct medium for athletes to determine which mental skills work best for them, and to potentially adhere to their mental skills training, which may have long-term benefits for their performance, as well as psycho-emotional profiles such as anxiety, stress, and overthinking.

Many powerlifters do not cope well with weight class/making weight stressors, due to the high levels of uncertainty involved with this process. The athletes whom find this to effect their mental state going into a competition can try a mindfulness programme, in addition with the usual rituals they take part in (e.g. being cognizant of their diet in the preceding days). This may help teach them how to take emotional control over the situation. By better managing their appraisals of the making weight process, they can better stabilise their mood and emotions going into the meet.

Relaxation techniques may not be the most ideal mental skill to implement, as many powerlifters thrive on an excitable-energised state prior to and during competition. However, athletes whom prefer to be low-key and relaxed going into a competition may benefit from progressive muscle relaxation prior to weigh-ins, as it may also help de-stress the athlete from competition-related anxiousness.

Powerlifters can sometimes succumb to their own fears of the actual, tangible weight of what they are attempting to lift; they may experience a sort of mental block. This is especially the case in the few weeks prior to competition, when they are lifting their heaviest lifts. In these events, it may help athletes to find one or two effective spotters at the gym. This is a concrete means of helping alleviate the fear of something going wrong during the lift, as it allows the athletes physical assurance that somebody is there for them in the event they cannot complete the lift. This may be used congruently with self-talk cues that are positive and motivational in nature, as motivational self-talk has been shown to improve power-driven movements (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004). Positive self-talk and imagery can also help athletes when they feel the emotional impact of competitions, which has led to worrying and anxious thought processes. It is important for the athlete to recognise the source of their worries, anxieties, and overthinking. Often, asking themselves, “why am I really feeling this way?,” or “what happened for me to think/feel this way?” will help athletes recognise the root of the problem, and eventually reframe their perspectives of the stressor.

Powerlifters have planned their programmes carefully, but many athletes from this thesis have stated the importance of a well-balanced lifestyle. A goal setting exercise can help athletes determine where powerlifting ranks in relation to other aspects of their life. When unexpected stressors arise, they can determine whether it is worth the turbulence in their plans, schedules, prior commitments, and generally worth taxing their resources to attend to. Goal setting through a writing exercise can help athletes imagine and commit to the goals they have set. Overall, powerlifters have as much to benefit from performance-enhancing mental skills training as other athletes. Practitioners are encouraged to learn more about this increasingly popular sport in order to extend the reach of their services, and to be able to advise a group of athletes that are on the rise.

### 6.3 Strengths

This thesis utilised several methodological strengths. The interview guide was edited by an external reviewer. Member-checking was conducted in order to confirm that participants agreed with what was in the interview transcripts; this was done to ensure credibility. In addition, a second coder with knowledge of sport psychology theory and concepts ensured reliability of the results, and was also a strength of this thesis work. From a theoretical perspective, this thesis assessed Williams and Andersen's (1998) stress-injury framework through competitive powerlifting, a particular type of strength sport. Strength sports are often overlooked in sport psychology research sampling; thus, this thesis' exploratory nature can be considered a strength, as it sheds light on an under-researched yet increasingly popular sport. Strength-based sports subtly differ from contact and aesthetics sports, as they pertain to stressors. This may potentially impact the applicability of the stress-injury model to strength sports. By interviewing powerlifters with a history of injury, this thesis was able to sense the generalisability of the theoretical framework within strength sports.

### 6.4 Limitations and future research

Certain limitations should be accounted for in this thesis. The stress-injury framework intends to predict injury outcome, which requires a research design more prospective and longitudinal by nature. Also, participants were not excluded based on rehabilitation duration; some participants had major injuries with extensive ("ongoing") recovery, while others had major injuries with fairly brief, albeit intensive, recovery. Major injury was the primary inclusion criteria, as opposed to length of rehabilitation. However, powerlifters who know they have already been engaged with extensive rehabilitation could have been excluded from the study, because length of recovery may influence their coping styles and their perceptions of coping resources available to them. The design of this thesis also required retrospective reflection of participants' past events. Inherently, this may expose participants to flawed memory recall, which may have impacted data collected. Lastly, while data collection was completed until saturation – no new information was collected and no new codes were revealed past the 7<sup>th</sup> participant (Guest, Bunce, & Johnson, 2006) – one or two more participants could have been recruited for saturation to be reached with absolute certainty. This was due to a

limitation in data collection duration. Data saturation is a measure of content validity in qualitative research (Fusch & Ness, 2015).

Several potential directions for future research can be extracted from this thesis. Future research in the stress-injury framework should focus on the predictive outcome of injury in strength sports. Results from this thesis demonstrate similar stress-injury associations, but should be confirmed. Longitudinal, prospective designs within the stress-injury framework are just beginning to emerge; therefore, exploring the relationship between sport types may be a valuable avenue of research in order to assess the generalisability of Williams and Andersen's (1998) theory. In addition, hardiness as a personality characteristic should be further explored for its moderating effect on the stress-injury relationship. Ford, Eklund and Gordon (2000) have cited hardiness as a means for athletes to cope with greater efficiency, while Salim, Wadey and Diss (2015) explain that athletes who are able to cognitively reframe injuries are more likely to seek emotional support. Due to powerlifters' tendencies to depend on social support, and to often use emotion-focused coping strategies in both stress and injury circumstances, this can be an interesting avenue for future research, as the results suggest its potential impact on coping constructs.

### 6.5 Practical implications

From an applied perspective, it is critical to take into consideration the personal lives of the athletes and how stress impacts injury and recovery, as well as the nature of their sport. It is important for clinicians to empathise with their patients' experiences, and to learn about the personal circumstances surrounding their injuries, as these psychological, emotional, and social aspects of athletes' lives have shown to impact their injury incidence, outcome, and rehabilitative duration. A major injury has a large-scale impact especially for these athletes, because it threatens their personal identities and sport ambitions. This is likely the reason why most or all powerlifters choose to adjust their training in accordance with their injured muscle groups. Powerlifters are typically knowledgeable about human anatomy due to the demands of their sport, although they may not be knowledgeable about the required physiotherapy exercises. Nonetheless, such a body of knowledge makes them different from other patients, and can affect how practitioners and clinicians choose to communicate with powerlifters when treating them, and the rapport built with them. The injury data presented in the

Results can allow practitioners to develop appropriate physiotherapy for their powerlifting clients, and for coaches to take into consideration the degree of mental stress experienced from powerlifting-related injuries. It may also imply that different injuries may result in varying levels of perceived mental stress, an important psychological assessment when working with injured athletes.

## 7 CONCLUSIONS

The results of this thesis suggest that while many similarities exist in the sport-related stressors and coping mechanisms used by injured powerlifters and athletes of other sport domains, minor differences exist, such as sport-related stressors (making weight, length of meets, post-training blues) and coping (use of handlers, lack of reliance on social networks during injury). While the direct stress-injury relationship in predicting injuries was not assessed in this thesis, results suggest that powerlifters experience similar psychological predisposition to injury occurrence as other well-researched athletes do, including higher trait anxiety, and exposure to a stressful event prior to sustained injury. Future studies exploring powerlifting athletes' psychological states are encouraged, especially in injury and rehabilitation research, as this athlete population is prone to specific injuries due to the nature of the sport.

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## Appendix A: Interview guide

- 1) Demographic questions:
  - a. Gender
  - b. Nationality
  - c. Age
  - d. Participation in powerlifting (years) (start of competitive training)
  - e. Wilks coefficient (if known).
  - f. competitive weight class
  - g. History of injury
    - i. How many previous injuries?
    - ii. Injury classification (what was the injury?)
    - iii. Severity
    - iv. Mechanism of injury (how were they obtained?)
    - v. Rating of how stressful injury experience(s) were/was/are/is (0=not stressful, 10=very stressful)
    - vi. Timeline of injury/ies
- 2) How did you get into the sport of powerlifting?
- 3) What stressors do you experience throughout a powerlifting season?
  - a. What stressors do you experience throughout training?
  - b. What stressors do you experience prior to competition?
  - c. What stressors do you experience throughout competition?
- 4) Have you experienced life events and/or small hassles/stressors that you felt have impacted your training and/or competition? If so, what are they?
- 5) How have you dealt with the stressors you have mentioned? Please be as detailed as possible.
- 6) What have you done to deal with your previous injuries? How did you deal with them?
- 7) Can you describe the role of your social circle (e.g. friends, family, loved ones, colleagues, etc.) in dealing with stresses and injuries of powerlifting?

\*appropriate probing questions will be used if necessary. Examples: “could you tell me more about that?”, “how do you mean when you say x?”, etc.