

Overtraining Phenomena: Expert and Athlete Perspectives
on Pathogenic Sport Involvement

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ABSTRACT

The purpose of this research project was to provide an in-depth account of elite athletes' experiences of, and experts' perspectives on, overtraining and its negative outcomes. I conducted interviews with athletes and sports experts, including coaches, sport doctors, scientists, and psychologists across a variety of sports. The interviews were focussed on identifying personal and situational risk factors for overtraining behaviours and outcomes. This thesis includes discussions of the responses to the interviews from the athletes' and the experts' perspectives, with distinct approaches to analysing and presenting the interview data from these two groups' different perspectives. For the 14 experts, I carried out inductive content analyses of the interviews and presented the results in a tree-structure showing the major categories, subcategories, and raw data themes emerging from the data. For the 13 athletes, I used a narrative approach to analysing and presenting their stories, which I aggregated into three core tales, represented by three constructed fictional athletes. From the athletes' stories, I found support for the perspectives presented by the experts. I also uncovered, however, unique accounts of overtraining experiences that provided insight into the intra-psychic conflicts, sometimes obsessive-compulsive features, and complicated relationships of the not-as-perfect-as-perceived-to-be athletes. Taken together, both sets of interviews revealed that overtraining behaviours are significant issues in most sports, whether skill- or effort-based, which may go against traditional conceptions of overtraining. In the general discussion, I present a descriptive model of overtraining risks and outcomes, which came together from the synthesis of the athlete and expert interview results, and, finally, I discuss implications for professional practice and make suggestions for future research.

DECLARATION

I, Sean Oliver Richardson, declare that the Doctor of Philosophy thesis entitled “Overtraining Phenomena: Expert and Athlete Perspectives on Pathogenic Sport Involvement” is 108,300 words in length, exclusive of tables, figures, appendices, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature:

Date:

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DEDICATION

I would like to dedicate this thesis to the athletes who shared their stories with me.

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CHAPTER 1: INTRODUCTION

Background to the Thesis

In the pursuit of excellence, athletes push themselves to the limits of their physical capacities, and many athletes and coaches have tended to equate large volumes of training with success. Such heavy training, however, can lead to the undesirable outcomes of decreased performance levels, illness, and injury. Athletes and coaches in this situation commonly respond to drops in performance by increasing the training load still further (O'Toole, 1998). In many sports, athletes are under substantial pressure to perform from coaches, parents, administrators, and themselves, and often will do “whatever it takes” to win (Gould, Tuffey, Udry, & Loehr, 1997; Krane, Greenleaf, & Snow, 1997). Although the intuitions of coaches and athletes alike drive them to this *more is better* philosophy in training for peak performance, the risk for an athlete to descend to a state of physiological exhaustion or injury escalates with mounting pressures and increasing workloads.

The negative processes and outcomes associated with excessive training load have been called *overtraining* (OT) and *overtraining syndrome* (OT syndrome), respectively (Kellmann, 2002). OT has been an identifiable issue in competitive sport since the 1920s (Parmenter, 1923). Griffith (1926) first referred to negative outcomes associated with intensive training as *staleness*. Research on OT did not begin to accumulate, however, until the mid-1970s and early 1980s, when competitive athletes began to train at substantially greater volumes and higher intensities than previously. Bompa (1983) estimated 10-22% increases in yearly training hours for a variety of sports during the five years from 1975 to 1980. Between 1972 and 1995, American Olympic level swimmers increased training loads from around 9000 meters to 36,000 meters per day (Peterson, 2005). Raglin and Wilson (2000) also estimated an increase of 20% in physical training across the 1990's.

In response to the increases in training volumes and intensities, potentially leading to illness, injury, and other OT outcomes, prevalent in today's competitive sports, athletes, coaches, and researchers seem to be improving awareness for the importance of balancing training with adequate recovery (Botterill & Wilson, 2002; Davis IV, Botterill, & MacNeill, 2002; Gould & Dieffenbach, 2002; Hanin, 2002; Hogg, 2002; Kellmann, 2002; Kellmann, Patrick, Botterill, & Wilson, 2002; Kenttä & Hassmén, 2002; Norris & Smith, 2002), acknowledging, perhaps, that more is not always better. Noting this shift in awareness, Kellmann (2002) quoted statements made by several professional athletes to German newspapers. A tennis player reported, "My recent successes are due to less tennis, more regeneration, and the forced break (due to injuries); I'm less exhausted and burnt out than the other players," (p. 4) and a cyclist reported, "I'm better this year because I train less; in other years, I was already tired before the race" (p. 4).

The previous quotes provide examples where athletes seem to have responded positively to potential OT situations. Nonetheless, it is likely that there are many athletes and coaches who are still risking OT and its negative outcomes. What I was interested in with this thesis was to present descriptive research on athletes', coaches', and sport scientists' experiences with OT processes and outcomes in elite sport. With the two studies in this thesis, the first an interview study with sports experts, and the second with athletes, I planned to illustrate different perspectives and experiences with OT. In congruence with these different perspectives, I have presented the interviews from the experts and the athletes in styles that fit the stories told by these two distinct groups.

Perspectives on Telling Tales

In deciding how to present the perspectives of the experts and tell the tales of athletes' experiences with OT and injury, I have considered Sparkes' (2002) descriptions

of the different ways of representing knowledge in qualitative research traditions. Sparkes noted the following:

Some suggest that researchers-as-authors need to indicate their positioning in relation to the research process and the other people involved. They also suggest that researchers engage in a self-reflexive analysis of the social categories to which they belong, since these enter into and shape what constitutes knowledge in any project. Consequently, for them, the author needs to be written into, and not out of, the text.

My life in sport as a competitor, a coach, an observer, and a sport psychologist, and my own experiences with the phenomena of OT and injury, have positioned me as an active participant in the research process and affected the way that knowledge will be represented in this thesis. As an author, I have been written into the text.

I began this thesis believing I would be telling a realist tale, highlighting the voices of the experts and the athletes. The results sections of the thesis are dominated by quotations from the participants. As Sparkes (2002) noted:

Realist tales are characterized by extensive, closely edited quotations. These are used to convey to the reader that the views expressed are not those of the researcher but are rather the authentic and representative remarks transcribed straight from the mouths of the participants. (p. 44)

With the extensive use of participants' quotations, I hope to invite the reader to take part in the stories, perhaps to identify with the athletes' experiences of overtraining or the experts' experiences of working with overtraining athletes. Nonetheless, with my own story of OT to tell, and with the changing viewpoints I encountered conducting this research, I have also included my voice, the confessional element of telling the tale, especially with respect to telling the stories of the athletes. As Sparkes remarked:

Even though there is a set of key conventions that frame realist tales, this frame is not rigid or impermeable. Those who feel increasingly uncomfortable about producing author-evacuated tales might consider writing more of themselves into the text when, for certain purposes, they feel this to be appropriate. (p. 54)

I identified with Sparkes' comments on how confessional tales allow researchers to describe how their points of view evolved through the research process:

The field worker's point of view is often represented in confessional tales as part of the character-building conversion tale in which the researcher, who had a view of how things might happen at the start of the study, comes to see things very differently as the study progresses. (p. 60)

I am not sure how often this evolution occurs in most qualitative studies, but I found that my views of how my research on OT might progress changed substantially during the course of the project. I still feel that the main thrust of my story comes from the participants' voices, from the experts' tales of working with OT athletes, and from the athletes' tales of OT and injury. I have, however, couched the experts' perspectives more in the realist tale mode, whereas, I have filtered the tales of the athletes' experiences through my own confessions. I hope that, by including my own voice in telling the tale, the reader may understand more clearly the perspectives presented and find the journey through the complex phenomena of OT experience more interesting and informative.

Rationale for the Thesis

Despite research findings that have linked changes in psychological and physiological variables to alterations in intensity and volume of training (Lehmann, Foster, & Keul, 1993; O'Toole, 1998; Rowbottom, Keast, & Morton, 1998, Steinacker & Lehmann, 2002), the research on OT has not clearly distinguished between markers that identify intense training and those that identify OT (Martin, Andersen, & Gates, 2000; Rowbottom et al., 1998, Steinacker & Lehmann, 2002). This lack of clarity about markers of OT seems to indicate that OT may not be identified easily during its onset, making it difficult for coaches and athletes to monitor training stress accurately. Nonetheless, coaches and athletes could benefit from more knowledge about the process of, and experiences with, OT to anticipate the situations that might put athletes at greater risk.

The most recent literature suggests that OT is a complex issue requiring a broad understanding of many factors, both training and non-training, in athletes' lives. Kenttä and Hassmén (2002) have described a conceptual model of the OT and recovery processes

in which they emphasised a holistic approach to understanding the stress/recovery balance in athletes. Kenttä and Hassmén outlined the importance of “focusing on the individual athletes and their perceptions of training and recovery” (p. 74). Through observation, case studies, and anecdotal reports, other researchers have also identified circumstances under which the balancing act is upset, or where personal and situational variables (sport and non-sport), lead to states of OT, illness, or injury (Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999; Gould, Tuffey, Udry, & Loehr, 1997; Krane, Greenleaf, & Snow, 1997; Uusitalo, 2001).

Research efforts could be concentrated on looking at the development of OT behaviour among athletes before the onset of OT syndrome, how and why athletes begin these behaviours in the first place, and what sorts of internal and external variables influence the OT process. Kenttä and Hassmén’s (2002) conceptual model provides a useful framework to describe the interactions among stressors, individual stress tolerance, and recovery processes. This model could be augmented with experts’ observations of athletes who have overtrained and stories describing athletes’ experiences with OT. In researching the multiple perspectives on and experiences with OT, I hope that we will gain a better understanding of what got athletes to the point of OT in the first place, what are the myriad possibilities that upset the balance of training and recovery, and to what sorts of situations or personal variables coaches and athletes might be alerted in the future to avoid upsetting the balance.

Purpose of the Thesis

The purpose of this thesis is to present in-depth descriptions of experts’ perspectives on overtraining and of athletes’ experiences with OT behaviours and outcomes. Hopefully, with increased understanding of the OT experience, athletes, coaches, parents, and sport administrators may be equipped with greater knowledge and

awareness to make better decisions about training and recovery. I am guided by the following research questions: What do experts, such as coaches and sport scientists, say about overtraining? What are their experiences of working with athletes who have overtrained? What factors may predispose athletes to OT behaviour and outcomes in the first place, even before a cycle of training has commenced? How would one describe athletes susceptible to OT? What situations and intra- and interpersonal variables push athletes to overtraining?

Evolution and Changes in Research Perspective

There has been a shift in goals for the outcomes of this project from producing a checklist of risk factors for OT to presenting detailed descriptions of experts' perspectives on OT and rich accounts of athletes' experiences with OT. Originally, I thought I might develop a neat checklist that could be applied to athletes in most situations; I have found, however, through the interviews with experts and athletes, that athlete behaviour, whether in sports or other areas of life, is too detailed and too complex to describe adequately in a checklist. Instead of an ostensibly exhaustive list, the interviews provided stories of athletes, and people who have worked with athletes, which tell us about the human experience with adversity (injury, illness, OT syndrome) in competitive sport.

There also has been a shift in focus of the research from one on OT syndrome, a singular outcome, to one on OT processes and behaviours with multiple negative outcomes. I can most accurately describe the changes in my perspective by saying my views have broadened and deepened. At the outset, I thought I would be exploring only the risk factors for *overtraining syndrome* (a negative outcome associated with fatigue and underperformance) in competitive sport, and that the research would be limited to sports typically associated with very high volumes and intensities of physical training, such as swimming, cycling, or rowing. The focus has broadened, however, from trying to identify

risk factors for this relatively infrequent outcome in elite sport, OT syndrome, to looking at risk factors for an entire process encompassing OT behaviour and outcomes, illness and injury, which are common experiences for most athletes. My view has deepened in that I have seen OT as an elaborate set of behaviours, with multiple outcomes, resulting from interactions among many variables in athletes' lives. I have observed that OT is about more than just understanding how athletes handle a given training load; it encompasses seeing athletes as complex beings, characterised by ontogenetic histories, influenced by significant others, and driven by intrapsychic conflicts. What I realised when I began talking to athletes was that, regardless of sport and intensity of training, most athletes have stories to tell of times when they have gone too hard, not recovered enough, got overstressed, returned too early from injury, turned a blind eye to a niggle that eventually got worse, acted desperately to achieve a goal that may not have been realistic, or made poor decisions about health, training, and injury, in general, when physically or psychologically vulnerable. The similarity among many of the stories is that they are connected by an underlying behaviour pattern (that of doing too much given the individual's capacity to cope). With an OT process-focussed perspective, one can see that it is possible for athletes to overtrain without high training volumes or intensities, and to risk negative outcomes beyond just OT syndrome, such as illness or injury, if they are compromised in other areas of their lives.

Summary

Understanding OT in elite sport is a complex issue. Many researchers have commented on risk factors for OT and injury in athletes; some have offered illuminating anecdotes, and others have presented case study findings illustrating some experiences with OT. Kenttä and Hassmén (2002) have proposed a comprehensive model for understanding the overtraining/underrecovery process in terms of a stress/recovery

balance. I developed a plan to interview elite athletes, coaches, sport doctors, psychologists, and exercise scientists. I thought I could get significant insight into the personal and situational factors surrounding OT processes and outcomes by exploring multiple perspectives from athletes in the field who have experienced OT and from experts who have worked with athletes who overtrained.

I endeavoured to continue the trend Kenttä and Hassmén started (2002), distinguishing causes and consequences of OT, and extending the understanding of personal and situational risk factors. The field is moving from research on identifying OT once it has happened to research focusing on anticipating OT behaviours and outcomes by looking at risk factors. With risk factor research, it might be possible to answer the question: Can one identify, and take steps to change, OT behaviour before it damages an athlete too severely? My aim with this thesis is to provide insight into OT experiences, so that athletes and people working with athletes can take such steps.

CHAPTER 2: REVIEW OF LITERATURE

This chapter comprises a review of the literature pertaining to OT in sport, including sections on definitions of terminology, research findings, and evidence of expert and athlete perspectives on and experiences with OT.

Definitions

As mentioned in the introduction, I started out this project thinking I would be examining something specific, called *overtraining syndrome*, a relatively infrequent (Urhausen & Kindermann, 2002), albeit significant, outcome in exercise and sports. With the broadening of my research focus, as guided by the interviews I conducted with experts and athletes, I began to stumble over the uses of *overtraining* terminology. *Overtraining* did not seem sufficient to describe what was going on with athletes in their everyday battles to balance their stressors with recoveries, their illnesses and injuries with good health practices, their intra- and interpersonal conflicts with well-being and quality of life. In workshops and presentations of my research, I started to talk about *over-doing-it behaviour* in athletes because I wanted to move away from stereotypes that people in the sport world, such as coaches and athletes, seemed to hold about *overtraining*. Nonetheless, I still felt challenged to look for adequate terms to describe what was going on, and I felt anxious about creating new terms that people in the field would understand and accept. Perhaps, where this process brings me is to a place where I will use certain terms in this thesis for descriptive purposes, while maintaining a shared awareness with the reader that OT processes and outcomes may elude comprehensive (and agreed upon) definitions. I will attempt, however, to present the different terminology that has been applied to the various aspects of OT in the literature.

In defining OT, it seems that researchers in the field have used many terms in different ways to describe both processes and outcomes associated with OT (Kellmann,

2002). Terms that have been used to describe, define, or have been associated with OT include the following: overreaching, staleness, burnout, overfatigue, overwork, overload, underperformance, underrecovery, and short- and long-term OT (Kreider et al., 1998b; Kellmann, 2002). There has been confusion, however, about whether OT may have positive or negative sequelae, about whether it should be considered a process, an outcome, or both, about whether different aspects of OT are causes or consequences, and about the varied usage of different terms in the field associated with OT. I have presented definitions in the following sections, illustrating some of the subtle differences among usage of OT terminology.

To begin with, it may be useful to look at a description of how the training process is viewed today. Steinacker and Lehmann (2002) outlined what training includes:

Athletic training consists of repetitive phases of normal training, high-load training, overload training, overreaching, and recovery. During the training program, training load -- defined by the intensity, duration, and frequency of exercise -- varies and should gradually increase in response to the training-induced adaptation of various physical systems. This increase in training load is necessary to ensure further responses to a training program. Coaches often organize training in alternating cycles of increasing training load and enhancing regeneration. Such training cycles, which are relatively safe, allow the training load to reach a high, sustainable level for a short time. During the process (which is called supercompensation, or overreaching) the exhaustion and fatigue resulting from the high-load training phases elicit corresponding cellular stresses and consecutively raises [sic] performance in the recovery phases as an adaptation to the training overload. (p. 103)

What seems evident from the above description of the training process is that athletes are intentionally pushing their training hard to get optimum results; high levels of fatigue and physiological adaptations are to be expected, and peak performance after a period of recovery, usually referred to as a *taper*, is the objective of the process.

Overtraining

The following represent definitions of OT presented by various researchers in the field. Steinacker and Lehmann (2002) have stated:

Overtraining is a long-lasting performance incompetence due to an imbalance of sport-specific and nonsport-specific stressors and recovery with atypical cellular adaptations and responses. Besides performance incompetence, many other clinical problems may arise as a result of overtraining, including sports injuries, infections, or mood disturbances such as fatigue or depression. Imbalance of stress (training-specific, psychological, and non-specific) and recovery determines the outcome of a given training situation. Most clinical problems are observed in training with a high metabolic load of more than 4000 kilocalories per day. Training with lower metabolic demands may also result in performance incompetence and clinical symptoms; however, these problems result mainly from non-metabolic causes rather than sport-specific stressors and incomplete recovery. (pp. 103-104)

Steinacker and Lehmann have provided a definition that describes OT as both a process and an outcome, and have included several other possible adverse outcomes associated with the process of OT. Similarly, Hooper and Mackinnon (1995) and O'Toole (1998) outlined many of the possible outcomes of OT, describing OT as a process, or behaviour, that leads to a state of non-adaptation associated with negative outcomes, such as prolonged fatigue, depression, illness, injury, and long-term disruption of general physical and psychological well-being. Nonetheless, Hooper and Mackinnon indicated that *overtraining* is a process, whereas *overtraining syndrome* is an outcome, representing the extreme end state of non-adaptation that results from OT behaviour.

In contrast to authors who have presented OT in a negative light, Raglin (1993) originally described OT as an “integral and necessary aspect of endurance training”, where it is regarded as a “stimulus consisting of a systematic schedule of progressively intense physical training of a high absolute and relative intensity” (p. 842). Hackney et al. (1990) viewed OT as part of the training process, but described it as an abnormal extension that leads to a state of “staleness” or “being overtrained” (p. 22). Kreider et al. (1998b), however, focussed on OT as a state of stress accumulation, not distinguishing OT as a process from OT as an outcome, with the following definition:

Overtraining is an accumulation of training and non-training stress resulting in a long-term decrement in performance capacity with or without related physiological and psychological signs and symptoms of overtraining in which restoration of performance capacity may take from several weeks to months. (p. viii)

Lehmann et al. (1999) presented OT in both positive and negative terms, distinguishing the definitions by time frame, short- or long-term:

Short-term overtraining (also called overreaching or supercompensation training) is a common part of athletic training, which leads to a state of overreaching in affected athletes. This state of overreaching is characterized by transient underperformance, which is reversible within a short-term recovery period of one to two weeks and can be rewarded by a state of supercompensation (an increase in performance ability following one to two weeks of regeneration after a short-term phase of overtraining); therefore, short-term overtraining, or overreaching, is a regular part of athletic training. (p. 2)

Long-term overtraining occurs when overreaching is too profound or is extended for too long; this occurs if the necessary regeneration period is inappropriately short or recovery therefore remains incomplete and is additionally associated with too many competitions and non-training stress factors. The athlete clearly runs the risk of a resulting overtraining syndrome (p. 2).

With the above definitions, Lehmann et al. have still attached positive implications to OT, equating short-term OT with overreaching, and seeing it as a necessary process in achieving optimal performance. Armstrong and VanHeest (2002) noted the ongoing debate about positive and negative uses of the terms *overtraining* and *overreaching*, stating that “some authorities view overreaching as a deliberate attempt to induce optimal performance” and “others view it as an unplanned, undesirable outcome of strenuous training.” (p. 187). Armstrong and VanHeest indicated that, although they saw overreaching as positive, defining it in terms of a process that brings about supercompensation, they viewed OT, short- or long-term, as negative, and associated with chronic performance decrement.

Overreaching

Looking at definitions of overreaching, there is, once again, confusion about whether it is positive, negative, whether it is to be equated with OT, and whether it is necessary to achieve optimal performance. The following are definitions found in the literature:

Overreaching refers to training that involves a brief period of overload, with inadequate recovery, that [sic] exceeds the athlete's adaptive capacity. This process involves a temporary performance decrement lasting from several days to several weeks. (Armstrong & VanHeest, 2002, p. 187)

Overreaching is an accumulation of training and non-training stress resulting in a short-term decrement in performance capacity with or without related physiological and psychological signs and symptoms of overtraining in which restoration of performance capacity may take from several days to several weeks. (Kreider et al., 1998b, viii)

Although some coaches, researchers, and others might claim overreaching is necessary during the training process, a consensus statement, outlined at a USOC/ACSM human performance summit, concluded that overreaching should be avoided because of its unpredictable outcomes (Urhausen & Kindermann, 2002). Such comments, questioning the necessity of overreaching, may be at odds with many training practices; it seems that in using these terms, researchers are juggling semantics and artificial categories. Having been a competitive athlete in several different sports throughout my life, I have yet to hear a coach or other athlete refer to a planned process of training as *overreaching* or *overtraining*. Elite athletes train hard, often extremely hard, and get tired during heavy training; fatigue is expected no matter what it is called. Following heavy training, if the training and recovery have been well managed, athletes will recover and perform well. If the training and recovery have not been handled well, athletes will not recover sufficiently to perform at their peaks.

Staleness

If there was not already enough confusion about overreaching and OT, researchers often use the term *staleness* to refer to the state of sustained fatigue or underperformance experienced by athletes. Staleness ostensibly represents a less severe stage in the development of the OT syndrome (Silva, 1990). Staleness has been regarded as an undesirable response that is a consequence or product of OT (Raglin, 1993). Staleness has

also been equated with OT syndrome (Hooper & Mackinnon, 1995), and Hackney et al.

(1990) defined staleness as:

A state in which the athlete has difficulty maintaining standard training regimens and can no longer achieve previous performance results (i.e., performance decline). The terms "staleness" or "being overtrained" are commonly used interchangeably. This term can be defined as the end "result." (p. 22)

Silva (1990) described staleness as “an initial failure of the body’s adaptive mechanisms to cope with psychological and physiological stress” (p. 10). Perhaps, like croissants, stale athletes could be described as a little mouldy, dry, and crusty around the edges. Although most researchers appear to be in agreement that staleness is an outcome of the OT process, and is pretty much the same thing as OT syndrome, there does not seem to be any good reason to use the term, aside from adding more jargon to an already confusing lexicon in the field. It might be important to acknowledge the usage of staleness by researchers throughout history; yet, to promote understanding among future researchers and readers, it appears parsimonious to use only the terms *overtraining syndrome* to describe the outcome state of fatigue, resulting from overtraining processes.

Burnout

If there were not enough terms used to describe athletes’ changes in performance and struggles with fatigue, researchers have added the term *burnout* to the list of descriptors associated with OT. After having read much of the literature on burnout in sport, and the original burnout literature in the sphere of human services, I am left with the sense that *burnout* and *overtraining* are terms that can be confused because they both describe processes surrounding, and responses to, stress overload. Furthermore, *burnout* is a term that I have heard used frequently among athletes and coaches, alike, to describe feelings of being fed up with some, or all, aspects of their sports. Looking at the original definitions, however, the most significant distinction seems to be that *burnout* was used to describe stress responses among people working in human services and *overtraining* was

used to describe stress responses among athletes training in competitive sports. I am not sure that using the term *burnout* in overtraining research does more than add confusion; nonetheless, the large amount of research on, and the seeming similarities between, the two concepts justify a more thorough examination of the terms.

The term *burnout* was coined by clinical psychologist Herbert Freudenberger (1974), who used it to describe stress responses among staff members of clinical institutions, such as free clinics and halfway houses. Most burnout research has continued to focus on people in human services occupations, and has been based on Maslach and Jackson's (1981) definition of burnout as a stress reaction syndrome comprised of three dimensions, emotional exhaustion, depersonalisation, and feelings of low personal accomplishment. Maslach (1982) suggested that burnout:

Is a response to the chronic emotional strain of dealing extensively with other human beings, particularly when they are troubled or having problems. Thus, it can be considered one type of job stress. Although it has some of the same deleterious effects as other stress responses, what is unique about burnout is that the stress arises from the *social* interaction between helper and recipient. (p. 3)

Furthermore, Maslach also commented:

A pattern of emotional overload and subsequent emotional exhaustion is at the heart of the burnout syndrome. A person gets overly involved emotionally, overextends him- or herself, and feels overwhelmed by the emotional demands imposed by other people. (p. 3)

According to Maslach's descriptions, it seems that, similar to *overtraining*, *burnout* is about experiencing an overload in some way, and reacting negatively to that overload. Nonetheless, Maslach makes a clear point that burnout is unique, distinguishable from other experiences of stress, in that it is about *job stress*, and, in particular, stress arising from human services employment. This issue regarding job stress seems to be the clearest point of departure from similarities to OT, which would not be described as a stress response arising from a helper-recipient relationship.

If the original definitions do not seem clear enough to warrant keeping *burnout* and *overtraining* separate, questions surrounding the conceptualisation of *burnout* detract from the already uncertain association between the two terms. Although Maslach's conception of burnout included three dimensions, emotional exhaustion has often emerged in research as the most significant component of the burnout response (Jackson, Schwab, & Schuler, 1986; Posig & Kickul, 2003). Various researchers (Evans & Fischer, 1993; Lee & Ashforth, 1990; Meier, 1984) have called into question the dimensionality and construct validity of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981), suggesting that support for the three-component model has been equivocal. It seems, therefore, that if there is disagreement in the burnout research about the construction of the *burnout* concept, it would make sense not to apply the term to a new domain, at least until questions within the original field have been settled.

Nonetheless, having derived some parallels between stress responses among human services workers and athletes, coaches, and other sport staff, researchers in sport have adopted the burnout concept and examined it within the sport world, often using the MBI, or adaptations of it, as a measure of burnout (e.g. Dale & Weinberg, 1990; Gould, Tuffey, Udry, & Loehr, 1996, 1997; Gould, Udry, Tuffey, & Loehr, 1996; Kelley, 1994; Kelley & Gill, 1993; Martin, Kelley, & Eklund, 1999; Raedeke, 1997; Raedeke & Smith, 2001; Schmidt & Stein, 1991; Smith, 1986; Udry, Gould, Bridges, & Tuffey, 1997; Vealey, Armstrong, & Comar, 1998; Vealey, Udry, Zimmerman, & Soliday, 1992). Many of the researchers of burnout in sport may be applauded for their efforts to test, measure, and describe complex phenomena surrounding athletes', coaches', and others' stress reactions in sport. That coaches and human services workers both are in helper-recipient positions seems to be justify the use of *burnout* in examining the coaching population. There still

seems to be no reason, however, to use the term *burnout* with athletes, at least based on how it has been defined.

Looking for ways to integrate the concept of *burnout* into sport, Smith (1986) presented a theoretical cognitive-affective model of athletic burnout, which might be applied to athletes and people, such as coaches, working with athletes. Smith suggested that *burnout* is more severe than *staleness* and defined burnout as a psychological, emotional, and, often, physical withdrawal from a formerly pursued and enjoyable activity as a result of chronic stress. Smith described the major components of burnout with several key statements, outlined here in Table 1:

Table 1.

Major Components of the Burnout Syndrome (adapted from Smith, 1986, pp. 37-42)

Statements Regarding Burnout
Burnout is a reaction to chronic stress.
People suffering burnout experience low energy, chronic fatigue, and an increased susceptibility to illness.
At an emotional level, feelings of depression, helplessness, and anger are frequently reported.
Tension and irritability occur . . . and increasingly negative attitudes toward the activity may generalize to other areas of life as well.
At a behavioural level, decreased efficiency and inconsistent performance occur, and at extreme levels . . . withdrawal may result.
In most cases of burnout, the person feels outweighed by the demands of the situation, although boredom experienced when resources greatly exceed demands can also be involved.
A state of learned helplessness can result that undermines still further the person's motivation and ability to cope.
A final cognitive characteristic of burnout is a loss of meaningfulness concerning what one is doing and a subsequent devaluation of the activity.

Here, Smith (1986) provided a description of burnout that could, conceivably, fit with the concept of OT in some ways. A few of the symptoms of burnout, such as fatigue, susceptibility to illness, and inconsistent performance, echo those observed in OT, and perhaps have prompted OT researchers to integrate the two terms. Nevertheless, descriptions of OT differ from those of burnout in significant ways. OT is often associated with extremely high levels of motivation, as opposed to the loss of motivation proposed with burnout; boredom, where resources exceed demands, is the antithesis of OT; and, athletes who are overtraining do not seem to devalue their activities, rather they pursue them vehemently. Despite apparent differences between OT and burnout, Smith's model seems applicable to coaches and other employees in sport. In a review of the burnout in sport literature, Dale and Weinberg (1990) noted, "coaches fit into the framework of the human service or helping professions and seem to be a prime candidate [sic] for burnout" (p. 74). Several researchers in sport, thus, have chosen to explore the burnout concept within these sport employment related contexts (e.g., Kelley, 1994; Kelley & Eklund, 1999; Kelley & Gill, 1993; Rainey, 1995; Vealey et al., 1992)

Returning to looking at burnout in athletes, McCann (1995) identified the substantial confusion about the differences between OT syndrome and burnout, but stated "the most obvious overlap between the overtraining and burnout syndromes is that stress appears to play a major role in the aetiology of each. A salient difference between the two syndromes, as typically defined, is the specific theoretical role of cognitive factors posited for burnout" (p. 352). In other words, McCann noted that classic definitions of burnout and OT syndrome tend to separate the two along physical and psychological lines. OT, on the one hand, involves stress overload from a physical stressor (training load) and may not necessarily involve overload from cognitive/emotional sources. Athletes may overtrain physically, while maintaining high levels of emotional investment and motivation, but

cannot overtrain without the presence of the physical stressor. In contrast, burnout seems to involve overload primarily from psychological stressors, which leads to emotional exhaustion and loss of motivation.

More recently, researchers in overtraining have begun to talk about burnout within stress-recovery based approaches (Kallus & Kellmann, 2000; Kellmann & Kallus, 2000; Kentta & Hassmen, 2001), where athletes may be considered to be at higher risk for burnout if they do not have resources to manage the balance between their stress and recovery states. Looking at the parallels in processes preceding both overtraining syndrome and burnout, researchers (e.g., Kallus & Kellmann, 2000; Kentta & Hassmen, 2002) have suggested OTS and burnout result from stress-recovery imbalances. Hassmen (2001) depicted burnout, however, as a more severe outcome than overtraining syndrome. Describing burnout as a result of stress-recovery imbalances fits with McCann's (1995) illustrations of burnout as resulting primarily from psychological stress; nonetheless, suggesting that burnout follows from OTS obscures the clear distinction between the two terms as resulting from either primarily physical or psychological sources. Burnout happens because people get emotionally overloaded, which can happen to athletes. Overtraining syndrome occurs because people have overloaded their bodies, physically. The two terms are most clearly distinguished along these lines – stress recovery imbalances may lead to either state, with similarities in symptomatology. Why not call the state *burnout* when the imbalance results from psychological stressors and leads to an emotional overload, and overtraining syndrome when the imbalance results from primarily physical stressors and leads to a physiological breakdown?

Reviewing this previous discussion of burnout, it appears that *burnout* shares similarities with respect to origins, signs, and symptoms of OTS. Burnout sounds like an appealing term to apply to athletes because it describes how people get exhausted in

response to chronic stress – similarly, overtrained athletes can be characterised as being exhausted in response to chronic stressors. The emphasis on the psychological stressors in burnout, in contrast to the emphasis on the physical stressors in OTS, seems to be a key factor in distinguishing the two concepts. Burnout may be considered one outcome of a stress-recovery imbalance – athletes get fed up with stress overloads and feel like they don't want to do their sports anymore – but burnout does not necessarily involve the physical break-downs associated with OT. It is the physical element of OTS that leads me to feel uncomfortable suggesting that burnout is the most severe end stage of OTS; it seems that the term *overtraining syndrome* adequately describes the state of physical exhaustion, and associated symptoms, experienced from a prolonged imbalance between sport-related stressors and recovery. Burnout might occur as part of a stress-recovery imbalance but only where the resulting exhaustion could be attributed primarily to emotional/cognitive stressors. Therefore, burnout could be seen to be a possible outcome of overtraining processes, but I do not see it as a more severe outcome than OTS on a linear continuum of overtraining outcomes. Given the original definitions of burnout, the applications of the term in sport, and previous discussions of OT terminology, it seems that there might be some benefit to using the term burnout to describe emotional overload from stress-recovery imbalances, but not as a descriptor of a severe end-state following OT syndrome.

Underrecovery

Finally, in an attempt to shift attention away from training, OT, and the confusion surrounding these terms, Kellmann (2002) has moved to a focus on the recovery aspect of athletic experience. According to Kellmann's view, instead of OT, athletes can be described as experiencing "underrecovery":

Underrecovery is the failure to fulfil current recovery demands. Underrecovery can be the result of excessively prolonged and/or intense exercise, stressful

competition, or other stressors. Underrecovery can result from training mistakes, such as monotonous training programs, more than three hours of training per day, more than a 30 percent increase in training load each week, ignoring the training principle of alternating hard and easy training days or by following two hard days with an easy day, no training periodization and respective regeneration micro-cycles after two or three weeks of training, or no rest days (p. 3).

The introduction of the term *underrecovery* might draw attention away from the “over” terminology, and take the heat off some coaches for training athletes too intensively.

Kellmann even suggested that “insufficient and/or lack of recovery time between practice sessions is the main cause of the overtraining syndrome” (p. 12). Budgett (1998) supported this statement, proposing that underrecovery, not necessarily too much training, leads to the overtraining syndrome.

The shift in focus from training to recovery might also be useful in emphasising neglected areas of athletes’ lives, as well as for highlighting individual differences in recovery needs. Kellmann (2002) defined *recovery* as an “inter- and intra-individual multilevel (e.g., psychological, physiological, social) process. . . for the reestablishment of performance abilities” (p. 10). It involves physiological factors (restoring nutritional resources, and getting sufficient sleep), psychological components (feelings of relaxation, sense of well-being and positive moods), and social activities (getting together with friends, healthy relationships with others). Looking at all of these different aspects of recovery broadens the focus on what might be leading athletes to feel fatigued, beyond the volume and intensity of the training program. Furthermore, as Kellmann noted, “recovery is specific to the individual and depends on individual appraisals” (p. 7); each athlete might have different recovery strategies; what works for one athlete might not work for another. Kellmann referred to an individual’s response to training and non-training stressors as the *recovery-stress state*, a term that encompasses Lehman et al.’s (1993) earlier description of factors that threaten to imbalance athletes’ lives:

Inter-individual differences in recovery potential, exercise capacity, non-training stressors, and stress tolerance may explain the different degrees of vulnerability experienced by athletes under identical training conditions. (p. 16)

Kellmann concluded his discussion of underrecovery, suggesting that it has the same impact as OT in that performance declines, but Kellmann noted that underrecovery is the precursor/cause of the OT syndrome. Using the term *underrecovery* seems to have highlighted some important factors on which coaches, athletes, researchers, and others might focus to ensure a holistic and healthy approach to athletic training; nonetheless, the concept of balancing stress and recovery behaviours may still elude definition by a single term.

Review of OT Terminology

Labels and definitions may be helpful to keep an area of research focussed; although, it seems that defining OT processes and outcomes has created some confusion, or, at least disagreement, among researchers and others. Perhaps the confusion and disagreement have arisen because the process of balancing stressors and different forms of recovery, life issues, and intra- and inter-psycho challenges is not easy to describe with a few concise terms. Generally, in OT research, there has been a focus on one outcome, OT syndrome. Many of the definitions presented, except for those offered by Steinacker and Lehmann (2002) and Hooper and Mackinnon (1995), whether describing OT processes or outcomes, exclude reference to other significant outcomes, such as injury and illness, which researchers (e.g. Kibler & Chandler, 1998; Steinacker & Lehmann, 2002) have also related to the same underlying behaviours.

Furthermore, based on my experiences as a competitive athlete, it seems to me that many coaches and athletes in Canada and Australia interpret any usage of terms, such as *overtraining*, *overreaching*, or “over“ anything, as negative. Coaches and athletes may not be happy to say that they are engaging athletes in *short-term overtraining* or *overreaching*,

even if researchers are using these terms to describe effective forms of training. For the coaches and athletes, there is just “training,” and either athletes are training well or they are not. Coaches seem particularly defensive about using any such terms because the implication for them is that there is something wrong with their training programs.

What seems pragmatic is to look at how competitive athletes and coaches work with these terms. As mentioned, in sport, there is training, which is either effective or ineffective in bringing about improved performance. There is an assumption that training has to be pushed, or increased, as fitness and performance improve, to stimulate further gains. Armstrong and VanHeest (2002) referred to this approach as *overload training*, “a planned, systematic, progressive increase in training stimuli that is required for improvements in strength, power and endurance” (p. 187). The overload principle is implicit, however, in contemporary athletic training program design. To use the terms *overtraining*, *overreaching*, or *overload training* to describe this process of challenging the body with increased loads seems superfluous, and can be confusing to many, because the use of “over” as a prefix implies that one has done something excessively. To talk about positive aspects of OT, therefore, seems contradictory. On the one hand, there is effective training, and, on the other hand, if OT is involved, short- or long-term, there is ineffective training. The sticking point seems to come from the original usage of the term to describe the process of overload training that is required for optimal performance (Morgan et al., 1987; Raglin, 1993). This usage may have reflected a shift in the way athletic training was approached when overloading, as a principle, was first taken on board by athletes, coaches, and sport scientists. It seemed that there was a need to differentiate regular training, which now might be seen as maintenance training or under-training, from the more effective form of overload training.

Perhaps, the most useful approach to understanding athletes' experiences with OT processes and outcomes is to stay focussed on effective and ineffective training and recovery processes and behaviours in the context of the stress/recovery balance. Kenttä and Hassmén (2002) have emphasised this focus, making distinctions between optimal training and negative OT, and viewing optimal training as an ongoing *psychosocial-physiological* balancing act. Kenttä and Hassmén suggested essential components of optimal training include physical adaptation to the training performed and the possibility for athletes to practice at the highest level of performance (optimal technique, speed, strength, aerobic power, and mental abilities). Ideally, general well-being is maintained despite heavy training loads, and performance capacity increases in a steady fashion. Optimal training is contrasted with negative OT, during which

a number of less desirable outcomes will become obvious. For example, the potential for high-quality performance or technique training becomes limited, and training increasingly psychologically demanding. The immune system becomes negatively affected, resulting in more infections and the resultant absence from training. Uncertainty exists as to whether the body will adapt only to a previous level of performance or accomplish a super compensation after recovery. (Kenttä & Hassmén, p. 59)

In looking at the stress/recovery balance and OT/underperformance issues, Kenttä and Hassmén (2002) also attempted to broaden understanding of what constitutes stress in athletes' lives:

Physiological stress is usually described in the literature as the predominant cause of underperformance associated with staleness and burnout. However, nontraining stressors have more recently gained a wider acknowledgment in regard to overtraining and burnout among athletes. (p. 69)

Furthermore, without a focus on the whole stress/recovery process, one might misattribute some of the outcomes of OT, such as illness and injury, to different causes, at the risk of making harmful decisions about training and recovery. For example, if athletes, coaches or others have decided that injuries or illnesses were the results of bad luck or bad timing,

rather than consequences of too much stress and/or not enough recovery, they may be more likely to repeat the maladaptive behavioural patterns, however inadvertently.

Some of the difficulty with defining OT is illustrated by the lack of clear indicators of OT. Hawley and Schoene (2003) suggested “some level of fatigue, depression, feelings of burnout, anxiety, irritability, and difficulty concentrating or sleeping is normal for athletes undergoing heavy training or competition” (p. 25). Furthermore, they stated that “athletes may also experience persistent muscle soreness, decreased coordination, reduced libido, and frequent upper respiratory infections. This training state is . . . an expected part of vigorous training” (p. 25).

The apparent lack of clarity regarding signs and symptoms of OT syndrome illustrates that when one uses the term *overtraining* in reference to athletes displaying certain signs and symptoms, it may not be clear whether those athletes are actually overtraining or simply going through a necessary adaptation phase of training, from which they will recover. It also seems important to make a decision about the positive versus negative uses of the term. What happens to the credibility for this field of research if some proponents are saying athletes need to overtrain/overreach to achieve optimal performance and others are saying these processes must be avoided at all costs? How can we identify athletes at risk for adverse outcomes, before they occur, if we are equating OT behaviour with the one outcome of OT syndrome? It seems that researchers could stumble with the singular focus on OT syndrome as an outcome, when they are trying to describe OT as a process. With a stress/recovery imbalance, if that is how OT is to be described, there is the possibility of several different major adverse outcomes, including injury, illness, and OT syndrome, with associated physical and psychological symptoms. In this context of stress/recovery balance, OT can be viewed as a behavioural pattern, with personal and situational predisposing factors that lead to a variety of negative outcomes.

Conclusion on Terminology

In this thesis, the term *overtraining* is used to refer to a negative process or pattern of behaviour. Outcomes of the OT process are identified separately, whether they are OT syndrome, injury, illness, or other forms of maladaptation. Other terms, such as staleness, overreaching, short- or long-term OT, and burnout, are used only when making reference to statements by other authors. I acknowledge that my usage of terms is consistent with the views of some, but not all, researchers.

Research Findings on Overtraining

Prevalence

The prevalence of OT syndrome in different sports has not yet been clearly established. There is a number of studies with some prevalence data for OT (Hooper, Mackinnon, Howard, Gordon, and Bachmann 1995; Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987; Morgan, O'Connor, Ellickson, and Bradley, 1988; Morgan, O'Connor, Sparling, and Pate, 1987), which have been regularly cited, despite weaknesses in that the statistics were often based on unclear classifications of OT syndrome, or on very small sample sizes. In two studies examining characteristics of elite distance runners, Morgan et al. (1988) and Morgan, O'Connor, Sparling et al. (1987) reported that 64% of males and 60% of females, respectively, indicated they had experienced *staleness* (OT syndrome) at some point during their careers. In both studies, researchers used the same definitions of OT syndrome to gather frequency data. Morgan et al. (1988) suggested that *staleness* is “usually characterized by a variety of behavioral, psychometric, and physiologic symptoms with perhaps the most salient features being: a) performance decrements or the inability to train at customary levels, b) chronic fatigue, and c) depression of clinical significance” (p. 251). Looking at this description of staleness/OT syndrome, I am not sure if a symptom of OT syndrome could be described as “psychometric.” Furthermore, from what was reported

in the studies, there did not seem to be any clinical assessment of depression in the athlete participants, although this was deemed to be an important component of the staleness definition. The researchers also did not state if *staleness* was explained or described to athletes before being asked to respond to the question of whether they had experienced staleness at some point during their careers. Based on an unclear description, even if the researchers did explain the concept of staleness to the athletes, it seems that the athletes may not have been in the position to make reliable statements about their OT experiences, leaving the reported frequencies in question. In a series of studies spanning 10 years, Morgan, O'Connor, Ellickson et al. (1987) monitored mood states, using the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992), in college swimmers, and suggested that, during peak, twice-daily training, "it is not uncommon for 5-10% of the swimmers to experience what we regard as staleness" (p. 108). Although Morgan, O'Connor, Ellickson et al. (1987) may have developed sensitivities for which swimmers were overtraining during their 10 years of observing such athletes, the prevalence statistics presented were only from an estimate made in passing, and not a frequency value derived from systematic inquiry. In contrast to the previously mentioned studies, where athletes were classified as stale/overtrained based on general definitions of OT syndrome, Hooper et al. (1995) derived an OT syndrome frequency statistic in a small group of swimmers, from a specific classification of OT syndrome, which they also referred to as *staleness*. Hooper et al. stated that swimmers were classified as stale if all of the following occurred:

- (a) failure of performance in the maximal effort swim to improve from early- to late-season; (b) failure of performance in the trials to improve from previous best times; (c) fatigue ratings in the [training] logs > 5 (scale 1-7) for more than 7 d consecutively; (d) comments in the page provided in each log that the athlete was feeling as though he or she was responding poorly to training; (e) a negative response to a question regarding presence of illness in the swimmer's log, together with normal leukocyte count and ESR [erythrocyte sedimentation rate] at testing time. (p. 108)

Based on these specific staleness/OT syndrome classification criteria, Hooper et al. found three out of the 14 swimmers (approximately 21%) could be identified as stale by the end of the season, that is following the Australian National swim titles. Here, Hooper et al. provided some idea of prevalence of OT syndrome, based on clear, specific criteria, among a group of elite swimmers. Unfortunately, the small sample size makes it difficult to generalise the finding to other athletes.

In examining much larger samples of athletes, Gould et al. (2002) noted that 28 percent of 296 U.S. Atlanta Olympians and 10 percent of 83 Nagano Olympians reported that they were overtrained in the 90 days prior to the Games and that the overtraining had a negative effect on performances. In all cases, Olympians in the Gould et al. studies were identified as overtrained if they answered *yes* to the statement “I overtrained in preparation for the Olympics” (p. 181). The researchers, however, appeared not to have given either the Atlanta group or the Nagano group definitions or explanations of OT. Given the concerns already discussed about clearly defining OT, it would seem that these prevalence statistics are not reliable; self-reports of OT, without any reference to OT criteria or definitions, do not seem to provide much useful data.

In a recent investigation, looking at the problem of overtraining in adolescent athletes, Raglin, Sawamura, Alexiou, Hassmén, and Kenttä (2000) asked 231 young swimmers from Greece, Japan, Sweden, and the United States if they had ever had a loss of performance sometime during their swimming careers, for at least two weeks, which was not a result of injury or illness, but due to training. Raglin et al. used this definition (i.e., perceived loss of performance) as the criterion for classifying athletes as having experienced OT, which the researchers referred to as *staleness*. Across the four countries, an average of 35% of the young swimmers reported experiencing the perceived performance losses, 20% from Sweden, 24% from US, 34% from Japan, and 45% from

Greece. Subsequently, the researchers classified these 35% as having experienced *staleness* at some point during their swimming careers. Although, Raglin et al. employed a more specific question than simply asking if athletes had been overtrained, it is not clear how reliable athletes might be for retrospectively assessing episodes of performance loss. How did these athletes decide what constituted a loss of performance? There could be any number of variables that affected the athletes' perceptions; for example, maybe some did not do as well as they hoped to do at certain swim meets, but were physically healthy. The comparison to others might have given them the impression that they were not performing well for a period of time. Maybe other young swimmers had pressure from their parents that made them feel they were not doing so well, but, objectively, they could have been performing adequately. In these examples, one would probably not want to attribute any perceived performance decrement to OT. It seems that it may have been helpful if the retrospective recall of performance losses was augmented with corroborating evidence from the coaches and others (competition results, training results, objectively identified episodes of performance decrement). With retrospective recall, which is a dubious method for gathering performance data, even asking athletes to refer to objective markers of performance in answering questions about performance decrements might help to produce more valid data, especially if backed up by coaches' reports, training data, and competitive performance results.

When I think back across my athletic career, I realize that it is quite difficult to answer a question about episodes of overtraining because there are some times where I may not have been aware of performance plateaus or decrements, and other times where I might have thought I was not performing well, but I was physically quite healthy. There are probably times where my performance was suffering because of an undetected illness or post-viral situation of which I was not aware. Now, with research background in this

field, I seem better equipped than previously to examine, retrospectively, different episodes of my own potential overtraining experiences, but I would still question how accurate I might be with such recall. There are difficulties defining overtraining in the first place, and therefore, it would follow that reliable prevalence data for overtraining may be hard to obtain. It might be acceptable to speculate that perceived performance decrements stand as preliminary evidence of OT syndrome prevalence, especially when athlete reports of performance losses are augmented with objective measures. Nonetheless, it might still be too big a leap to label such data on performance decrement as clear evidence of OT frequency in the athlete population.

Summarising the prevalence research reported here, given very specific criteria for judging OT syndrome, or what most researchers have called *staleness*, it seems that quite a small percentage of athletes may be classified as having experienced the syndrome. Given vague definitions, however, or none at all, for OT syndrome or *staleness*, and varying the targeted time span of retrospective recall (anywhere from the previous few months to a whole season to a whole athletic career), quite a large percentage of athletes may be classified as having experienced the syndrome. It seems that research has to become more rigorous in this area before one can make more definitive comments about the prevalence of OT syndrome in competitive sport.

Variations in Overtraining Processes and Outcomes

OT is an issue that affects athletes in many sports, whether it is in endurance activities like rowing and long-distance running or power events like weightlifting. Furthermore, OT affects athletes in various ways, with some incurring injury or suffering illness and others experiencing OT syndrome. Steinacker and Lehmann (2002) noted some of the potential variations in OT with the following statement:

Besides performance incompetence, many other clinical problems may arise as a result of overtraining, including sports injuries, infections, or mood disturbances such as fatigue or depression. (p. 103)

There also has been some suggestion in the literature that OT can be broken down into sympathetic and parasympathetic classifications (Kellmann, 2002; Lehmann et al. 1998; Lehmann et al., 1993). Sympathetic OT has been associated with such characteristics as increased resting heart rate and blood pressure, decreased appetite, loss of body mass, disturbed sleep, and irritability; parasympathetic OT has been associated with such patterns as low resting heart rate and blood pressure, long periods of sleep, and depression (Kellmann, 2002; Lehmann et al., 1993; Mackinnon & Hooper, 1994). Sympathetic OT has been linked to power and speed sports; parasympathetic OT has been linked to endurance sports (Kellmann, 2002; Lehmann, Dickhuth, & Gendrisch, 1991; van Borselen, Vos, & Fry, 1992). The distinctions between sympathetic and parasympathetic classifications appear clean, and make intuitive sense: if an athlete overloads the body in distinctly different ways (aerobic vs. anaerobic), one might expect to see distinctly different physiological responses. Nonetheless, based on the research findings, it is not clear whether such distinctions add clarity or increase confusion in trying to understand OT processes and outcomes. Fry (1998) made a clear statement that aerobic and anaerobic exercises should be considered differently in the context of overtraining:

It is quite evident that the adaptations to aerobic, or endurance, types of exercise are quite different from the adaptations to anaerobic exercise . . . [such as] resistance exercise. . . . What has not been as apparent in the overtraining literature is that overtraining with endurance exercise is also quite different from overtraining with resistance exercise. . . . As a result, one must be wary of using the endurance-overtraining literature to infer what happens during overtraining with resistance exercise.

In a study looking at increased volume training with US national-level judo athletes over 6 weeks, Callister, Callister, Fleck, and Dudley, (1990) suggested that intensive anaerobic training may present a different set of symptoms than endurance overtraining. Nonetheless,

with increased volumes of anaerobic training and concomitant decreases in performance, expected changes in sympathetic nervous system activity did not occur; there were no significant increases in resting heart rate and blood pressure.

In a pilot study on intensive resistance (anaerobic) training, Fry, Kraemer, Lynch, Triplett, and Koziris (1994) found no decrease in performance for maximal strength following an overload protocol, but did observe decreases on other physical tasks, such as speed-controlled strength and sprint speed. The investigators concluded that an overload stimulus in resistance training might create an OT response in non-training specific musculature, which is important for athletes and coaches to consider when designing training programs. To gain greater insight into the types of overtraining associated with anaerobic overloads, Fry, Kraemer, van Borselen et al. (1994) conducted a follow up study, during which they tested participants' responses to an even more intensive resistance training protocol than the one from the pilot study. In the follow up study, the researchers also looked at endocrine adaptations to the training. With higher intensities of resistance training, all participants experienced both decreased maximal strength on the training specific task and decreased performance on non-training specific tasks. To differentiate this type of overtraining from endurance types of overtraining, the investigators noted that participants did not display symptoms normally associated with aerobic overtraining (i.e., changes in sleep patterns, resting heart rate, or body composition). Furthermore, Fry, Kraemer, van Borselen et al. noted that endocrine profiles of these athletes were quite different than those associated with athletes training under endurance overloads:

With high relative intensity exercise overtraining, resting concentrations of both epinephrine and norepinephrine were unaffected, but acute concentrations exhibited considerable increases. . . . In general, the elevated catecholamine response to the resistance exercise stimulus during high relative intensity resistance exercise overtraining is evidence of the sympathetic overtraining syndrome. . . . It is also quite different from the attenuated catecholamine levels (i.e., parasympathetic

overtraining) reported for overtrained endurance athletes, again indicating the unique differences of training and overtraining with different modalities and protocols. (p. 118)

Although the results of these resistance training studies and of other anaerobic studies (e.g., Fry, Barnes, Kraemer, & Lynch, 1996) seem to provide some support for differentiating OT into sympathetic and parasympathetic classifications, it is difficult to reconcile such clean classifications of OT with much of the other research findings on physiological markers of OT. If no physiological marker, or group of markers, has been unequivocally identified for the OT syndrome, and if none of the changes in physiological markers can differentiate intensive, but effective, training from OT, then how can such markers be used to classify different types of OT? Fry (1998) mentioned that elevated catecholamine levels together with attenuated muscular performance may be indicative of the onset of a sympathetic OT syndrome; yet, he also pointed out that resistance trained subjects, who were not overtrained, exhibited significant positive relationships between immediately post-exercise circulating concentrations of catecholamines and muscular strength performance. Therefore, in the cases of both OT and non-OT outcomes, there may be elevations in catecholamines, but in OT there is a decrease in performance with no significant associations to levels of circulating catecholamines. It sounds like catecholamine levels are not predictive of performance decrements; rather such levels may be associated with high training loads. Similar to many endurance-training athletes, it seems, when resistance-training athletes increase intensities, they experience physiological changes, which seem to be specific to the type of activities in which they are involved. Such physiological changes occur whether one is overtraining or not, and there is no clear boundary line that may be indicated by the changes. The sympathetic and parasympathetic distinctions, thus, seem to be more about describing the differences in response to different types of heavy training that could lead to OT, than about classifying or predicting different

types of OT syndrome. Similar to aerobically-trained athletes, anaerobically-trained athletes might also display the same array of physiological signs and symptoms while engaging in effective training as they would while engaging in OT.

The key element for any type of OT syndrome seems to be performance decrement, and although there are a number of physiological signs and symptoms OT athletes might display, there are no clear physiological markers of OT syndrome, whether athletes are training aerobically or anaerobically. Nonetheless, the research looking at different types of training in the OT context appears to have been important in illustrating that it is possible to overtrain (as defined by sustained performance decrement) in different ways, and with different outcomes. Sometimes, athletes will feel heavy, fatigued, want to sleep a lot, other times, athletes may seem jittery and agitated in responding to different forms of training, but in all cases, with overtraining, there will be some clear indicators of sustained performance decrement or stagnation, which do not improve, even after a substantial period of recovery.

With regard to the variations in outcomes, it seems that it may be important to consider injury and illness along with OT syndrome as possible consequences of OT. Flynn (1998) suggested that, in some sports, OT might lead to musculoskeletal breakdown before the onset of OT syndrome. For example, excessive training volumes in swimming might lead to OT syndrome, whereas running at comparable volumes would more likely lead to joint or other musculoskeletal injury due to the high impact activity of the sport. Despite differences among sports, it seems possible that overtraining, as defined by an imbalance between stressors and recovery, might lead to injuries in any sport. Kibler and Chandler (1998) have discussed the potential interaction between OT and musculoskeletal breakdown:

Inappropriate volume or intensity of exercise may cause maladaptive cellular or tissue responses due to an imbalance between load and recovery. These

maladaptive responses occur to some extent in most all sports; however, they can certainly become part of the overtraining syndrome. The maladaptive responses may be objectively documented as distinct musculoskeletal injuries, such as alterations in muscle strength, flexibility, or balance, changes in joint range of motion, or stress reactions in bone. (p. 169)

Although Kibler and Chandler suggested that the precise mechanisms of musculoskeletal overtraining are not comprehensively understood, they pointed out that the maladaptations seem to originate from disruptions in cellular homeostasis (p. 169). Furthermore, Kibler and Chandler noted that, although “cellular disruptions occur in all athletes, the overtrained athlete is particularly susceptible to maladaptation and injury as the result of chronic overloads and disruptions” (p. 170). From this description of musculoskeletal breakdown in the context of overtraining, one might infer that athletes with the highest training loads and intensities are most likely to be at risk for OT and its outcomes. Nonetheless, Kibler and Chandler also were careful to clarify that the training load is only important as a “relative load compared to the muscle’s ability to protect itself against strain. Normal loads on weakened muscles, a relative force overload, are as capable of causing strain as supernormal loads on normal muscles, an absolute force overload” (p. 171).

Reviewing Kibler and Chandler’s (1998) discussions of musculoskeletal adaptations to training overloads, it seems that the relationship between overtraining and injury is subtle, sometimes hard to detect. According to these authors, adaptations associated with overload training may not appear as overt clinical symptoms, but may manifest in the system as mechanical alterations or decreases in performance efficiency (p.173). Furthermore, injuries from overload often arise from an accumulation of stress, with a gradual onset, making detection difficult and increasing the likelihood of misattributions about the causes of injuries. Kibler and Chandlers pointed out how overtraining in the musculoskeletal system can lead to injury, a process they described as a “cascade-to-overload injury”:

Tissue compromise can more frequently create functional biomechanical deficits as a result of alterations in flexibility, strength, strength balance, or skeletal reaction. The athlete attempts to compensate for these deficits by adopting alternate patterns of movement, position, and activity. These patterns are usually less efficient, creating even more overload, thereby closing the circle. (p. 174-175)

If athletes begin a training cycle with muscle weaknesses, muscle imbalances, or areas of inflexibility, they may be predisposed to overload types of injuries. Kibler and Chandler noted that such athletes would be susceptible to OT when exposed to the extrinsic demands of their sports, and may experience tissue failure and clinical symptoms if they continued to train in this susceptible state. In particular, Kibler and Chandler remarked that stress fractures may be manifestations of OT because the fractures often occur as the skeletal system cannot keep up with the demands of overload training (p. 177). In describing the potential mechanisms of skeletal injury, Kibler and Chandler suggested that weakened or fatigued muscles may not be able to handle either absolute or relative force overloads, thus transferring those forces to the skeletal system, producing stress reactions (p. 177-178). In relation to soft tissue injuries, the authors also noted that “inappropriate overload can be a causal factor in the acute muscle strain both in the form of abnormal biomechanics and a decrease in the ability of the muscle to protect itself” (p. 178). Timing also seems to be a crucial factor in the aetiology of OT injuries; often times, athletes returning from previous injuries will begin intense training too soon, risking further overloads, and chronic OT injury problems. It seems that coaches and athletes may not always be aware of the myriad ways that stress/recovery imbalances may occur, and may not look at OT as playing a role in the lead up to injury. Kibler and Chandler noted that OT might be overlooked in analysing common sports injuries:

Even in a situation where a hamstring injury is seemingly unrelated to overtraining, hamstring tightness from continued use or a muscle strength imbalance may be a hidden contributor to the injury. . . . Sub-clinical soft tissue injuries are injuries that may not be recognized as injuries by the athlete or the coach and are often overlooked as a possible causative factor [*sic*] of more severe injuries. (p. 179)

In reviewing the OT literature, the interactions between injury and OT are often not emphasised; yet, it appears that injury can be both a possible outcome of, and a contributing factor to, OT. In highlighting some of the potential injury/OT interactions, Kibler and Chandler noted, “musculoskeletal maladaptations and injuries can be a warning signal to the athlete and coach that the volume or intensity of training is too high, and overtraining is a possible causative factor” (p. 186).

Apart from injury, OT has also been associated with illnesses, such as increases in head colds, allergic reactions, and upper respiratory tract infections (Armstrong & VanHeest, 2002; Costill, 1986; Jokl, 1974; Mackinnon & Hooper, 1994; Niemen, 1998; Steinacker & Lehmann, 2002; Weinstein, 1973). In contrast to findings that regular physical activity has positive effects on immune function, there is evidence that high training loads will increase the risk of infections (Steinacker & Lehmann, 2002). It appears that prolonged, exhaustive exercise taxes the immune system and may result in clinically significant alterations in immune function.

Nieman (1998) noted that “epidemiological data suggest that endurance athletes are at increased risk for upper respiratory tract infections (URTI) during periods of heavy training and the 1-2 week period following prolonged and intensive aerobic exercise” (p. 193). Similarly, in reviewing the literature on illness in sport and exercise, Weidner (1994) showed that URTIs are the most common infection among elite athletes. Looking more closely at illness/OT interactions, Mackinnon (1998) posed the question, “Does illness due to intensive training cause or contribute to overtraining?” (p. 234). Mackinnon stated that frequent illnesses are considered common outcomes or symptoms of OT, and noted that there are similarities among symptoms of OT syndrome and infectious illness, such as persistent fatigue, decreased performance, inability to train effectively, muscle soreness, and lethargy (p. 234). Nonetheless, Mackinnon suggested that “the presence or absence of

infectious illness should be discounted or documented when diagnosing OT among athletes” (p. 234). Mackinnon did not seem to answer the question of whether illness contributes to OT syndrome, rather she seems to say that the consequences of illness mimic those of OT syndrome, and goes on to say that the presence of illness should be discounted in diagnosing OT. I am somewhat confused because OT syndrome seems to result from the inability of the body to adapt to stressors; if one of those stressors could be considered illness, then how would illness not contribute to OT syndrome?

In conclusion, it seems that illness might be both a contributing factor and an outcome of OT. When athletes are in a state of stress/recovery imbalance, they become more susceptible to infections and illnesses, which further stress their bodies, leading to higher risk for greater imbalances and OT syndrome. The initial stress/recovery imbalance is a manifestation of an OT process; the interaction of this OT process with illness is circular, each one may contribute to and be an outcome of the other. Gotovtseva, Surkina, and Uchakin (1998) made a clear statement that illness is part of the OT aetiology: “Along with the other classic symptoms of overreaching and overtraining, immune dysfunction and frequent colds have been found in overreached and overtrained athletes, and thus may be considered as markers of this athletic pathology” (p. 265).

Markers of Overtraining

Although underperformance is regarded as the hallmark of OT syndrome, it is not clear how much performance has to drop to indicate a state of OT, or whether the performance decrement is the result of OT or of other precipitating factors (Hooper & Mackinnon, 1995; O’Connor, 1998; Raglin, 1993). Athletes, coaches, and sport scientists have been interested in finding valid early warning signals upon which they can act to prevent undesired underperformance. Much of the research has focussed on assessing the onset of OT syndrome, and, although no single marker, or group of markers, have been

identified, the following represent physiological factors demonstrated to have a significant association with OT (where OT was determined by performance decrement): (a) hormonal responses to exercise load (plasma adrenaline, serum cortisol; Uusitalo, Huttunen, Hanin, Uusitalo, & Rusko, 1998); (b) changes in free testosterone/cortisol ratio (FTCR; Chicharro et al., & Vaquero, 1998); (c) maximal lactate concentration of incremental graded exercise (Jeukendrup & Hesselink, 1994; Urhausen, Gabriel, Weiler, & Kindermann, 1998); (d) hypothalamo-pituitary dysregulation (Urhausen, Weiler, & Kindermann, 1998); (e) lowered urinary norepinephrine (Mackinnon, Hooper, Jones, Gordon, & Bachmann, 1997); (f) changes in plasma glutamine (Rowbottom, Keast, Garciawebb, & Morton, 1997); (g) deterioration in neuromuscular excitability (Lehmann, Baur, Netzer, & Gastmann, 1997); (h) decreases in secretory immunoglobulin (IgA; Mackinnon & Hooper, 1994); (i) decreased heart rate variability during orthostatic challenge (Uusitalo, 2001); (j) decreased heart rate during maximal exercise (Hedelin, Kenttä, Wiklund, et al., 2000); (k) decreased muscle glycogen levels (Snyder, 1998); (l) and reduced sleep efficiency, as measured by wrist actigraph (Wall, Mattacola, & Levenstein, 2003).

The psychological research on OT has added to the physiological perspective, focussing primarily on the relationships among mood, as measured by the Profile of Mood States (POMS), training load, and subjective ratings of well-being. Researchers have suggested that mood disturbance and self-reports of well-being may be valuable indicators of impending OT syndrome (Berghlund, & Säfström, 1994; Fry et al., 1994; Hooper, Mackinnon, & Hanrahan, 1997; Hooper et al., 1995; Morgan, Costill, Flynn, Raglin, & O'Connor, 1988). Given that the research on psychological variables in overtraining has focussed almost exclusively on the POMS, I will attempt to review some of the more salient past, and most recent, research pertaining to POMS and overtraining.

Much of the POMS research has evolved from Morgan, Brown et al.'s (1987) series of studies looking at mood states in collegiate swimmers across a ten-year period. The researchers monitored mood states using the POMS across the competitive seasons for different groups of male and female swimmers, and reported that mood state disturbances increased in a dose-response manner in accordance with training loads. With increased training loads, POMS global mood disturbance scores increased, as measured by an aggregate of all the subscales (with the vigour subscale negatively weighted). Morgan et al. suggested, "monitoring of mood states during a given macro-cycle offers a potential method of quantifying distress and titrating training loads on an individual basis" (p. 113). Although, it appears that Morgan et al. took significant steps to initiate research on the relationships among mood states and training loads, some issues stand out from this research that have been carried through much of the subsequent investigations of the POMS in sport performance, and overtraining. From the series of studies Morgan et al. conducted, it appears that something is going on with POMS scores in relation to training load; generally, as training loads increase, scores on negative POMS subscales, tension-anxiety, depression-dejection, anger-hostility, fatigue, and confusion-bewilderment, tend to increase as well, while scores on vigour tend to decrease. Nonetheless, it is unclear what POMS scores reveal about specific individuals and how such scores might be most useful to coaches and athletes. Except for two cases out of approximately 400 swimmers, Morgan et al. did not provide any individual profiles. The researchers also did not provide any performance data, nor did they demonstrate any links between POMS profiles and individual performance. Using group norms to suggest what is going on with the POMS and athletic training obscures what is happening at the individual level. Reading this research, I do not have much idea what an individual POMS profile might tell me about any particular athlete. The authors emphasised that athletes who became *stale* displayed

high levels of mood disturbance, but did not indicate if there were athletes who became *stale* without the corresponding mood disturbance, or if there were athletes with high mood disturbance who did not become *stale*. Therefore, with no links to performance, and with observations reported only on a group basis, coaches looking at individual POMS profiles would not be certain about whether they were observing athletes who were coping well with training or were not coping well with training.

Morgan, Costill, Flynn, Raglin, and O'Connor (1988) conducted a study with swimmers looking at effects of short-term (12 days), high intensity training on mood states. The researchers found that for the group, mood disturbance increased significantly from day one to day five of training and then remained elevated for the following 7 days. The increases in mood disturbance, however, seemed to be mostly attributable to three out of the nine swimmers who displayed markedly higher profiles on average than the rest of the group. These three swimmers were also found to have significantly lower muscle glycogen levels and were not able to tolerate the prescribed training load. The authors reported that these three swimmers were not ingesting enough carbohydrate and were training at a caloric deficit up to 1000 calories less than the other swimmers. In this study there were no correlations reported among POMS scores and performance parameters. From what I can gather from the results, the simplest explanation for the increases in POMS scores and the inability to tolerate training load seems to be that these three swimmers were not eating enough.

Murphy, Fleck, Dudley, and Callister (1990) followed 15 Judo athletes training at the US Olympic Training Center (OTC) for a 10-week training cycle, monitoring mood states during different phases of high volume and high intensity training. The researchers found no significant changes in total mood disturbance scores; although, they did report significant increases in the fatigue subscale scores after week eight, compared to baseline.

They also reported a significant difference between week 2 of baseline and week ten after intense training for the anger subscale (although the anger subscale was similarly elevated after week four of baseline as well). Performance on strength and anaerobic endurance tasks declined during the study, but authors were not able to measure actual judo performance in the study. No performance parameters were linked to POMS scores. The authors commented that for these athletes “the typical signs of overtraining reported in the literature were not observed in response to a 50% increase in conditioning training volume” (p. 48). The authors also stated, however, that “the increased sport specific training had no demonstrable beneficial effects on psychological or performance measures” other than athletes reporting they felt “close to their peaks” (p. 48).

Verde, Thomas, and Shepherd (1992) administered the POMS to ten highly trained male distance runners on three occasions over 9 weeks of training, involving a period of deliberately increased training. The researchers reported significant increases in total mood disturbance during the increased training phase, with subsequent reductions in mood disturbance during the recovery phase. The researchers stated that none of the runners could be classified as overtrained during the study; nonetheless, they noted that six out of the ten reported symptoms indicating they were close to a threshold of excessive training, “which most coaches would like to detect” (p. 173). Similar to other studies, no links were tested or illustrated between POMS scores and performance parameters; individual POMS score patterns were also not discussed in relation to performance. Once again, it seems one is left with a vague picture of what POMS scores might be revealing in the context of overtraining.

Berglund and Säfström (1994) were perhaps some of the first researchers to use individual POMS scores in a meaningful way to modulate training. With a group of canoeists training for the Olympics, the researchers used POMS scores to titrate training

loads. If athletes scored more than 50% higher than their own basal off-season global mood disturbance, training was reduced. For athletes who scored lower than their own off-season global POMS + 10%, training was increased. None of the athletes developed signs of OT in connection with the Olympics, and, thus, the researchers concluded that “the monitoring of psychological mood disturbances is useful in reducing the risk of staleness in canoeists undergoing hard training” (p. 1036). From an athlete’s perspective, I would say that any attempt to give some control to the athletes in terms of making decisions about changes in training volume according to how they feel could be useful. From my experience, it seems that a lot of athletes will not speak up about how they are tolerating a given training program for fear of how coaches and other athletes might react. Setting up a training model where changes in the training, either to reduce, or to increase, training according to how athletes report feeling appears unique. Such an approach changes the whole dynamic of the training environment, which all too often leaves athletes feeling pressured into doing more than they can handle at certain times, and perhaps responding by doing less than what is optimal at other times. From an applied perspective, this use of the POMS to modulate training appeared to be beneficial to the training outcomes of the athletes. Nonetheless, from a research perspective, the lack of a control group, and the lack of objective links made between POMS measures and performance parameters, leaves one wondering if perhaps the POMS, in and of itself, was useful as an indicator of overtraining. It is not clear whether these athletes may not have had the same results or better, even without the changes that had been made to training in accordance with POMS scores. I have trained with a number of coaches who might read the results of this study in a very different light, saying that the athletes probably would have done even better if their training had not been reduced at any time (although such coaches would probably have agreed with all training increases).

In one of the first studies to examine, statistically, the link between POMS scores and performance after intense training, Hooper, Mackinnon, and Hanrahan (1997) found no significant correlations between POMS scores and maximal effort swimming performance for a group of eight male and eleven female, nationally ranked swimmers. Looking at the pattern of POMS scores across a six-month season, the researchers also found no significant changes in any of the POMS measures with tapering. They did classify three swimmers in their study as *stale* according to quite strict criteria, but only two out of these three *stale* swimmers displayed elevated mood disturbance profiles. Furthermore, these two swimmers with elevated mood disturbance reported such disturbances during early season, tapering and post-competition, not during the high intensity, high volume cycles of training, suggesting that their mood disturbance was probably not linked to excessive training loads. Hooper et al. stated, “the data suggest the POMS may not be a sensitive indicator of staleness under all circumstances and may not necessarily differentiate between stale and intensely trained, but not stale, athletes” (p. 9). They also noted. “the decrease in physiological stress of training with tapering may have coincided with an increase in psychological stress with impending competition, making changes in mood states unlikely until after competition ceased” (p. 10). This seems to suggest that there may be all kinds of different variables that affect POMS scores; some athletes show elevated scores with intense training that is effective; some show elevated scores with intense training that is excessive and may lead to overtraining syndrome; some show elevated scores because of the stress of upcoming competition; some show elevated scores for reasons completely unrelated to training or competition; and, some athletes do not show any corresponding elevations of POMS scores in all of the previously-mentioned situations. It seems, therefore, that POMS scores are not reliable markers of OT. Hooper et al. commented, “while it appears that the POMS may be useful for monitoring those

athletes predisposed to staleness, it may not reliably differentiate between stale and non-stale athletes under all circumstances” (p.11). The difficulty still remains, however, with determining how to classify an athlete as predisposed to overtraining in the first place.

In another study testing the relationship between POMS scores and performance after intense training, Hooper, Mackinnon, and Howard (1999) reported significant correlations between POMS Confusion subscale scores and changes in maximal swim effort after a taper for a group of ten nationally ranked swimmers. There were no significant correlations, however, between performance changes for any of the other POMS subscales, or the global mood disturbance scores, and performance. The authors concluded that the “addition of a psychological variable (i.e., the POMS measure of Confusion) in the prediction battery is consistent with previous research suggesting that mood states are useful in monitoring training loads” (p. 1208). Contrary to the findings of this study, the subscales of Vigour and Fatigue have emerged as the most salient in terms of links to training load in much of the research (e.g., Morgan et al., 1987); researchers have also suggested that the Depression subscale might be particularly important in relation to OT (e.g., Morgan et al., 1987). Hooper et al. have now reported a significant link between the Confusion subscale and performance for a small sample size; it may lead one to question whether this one significant correlation was spurious. If one were to make recommendations to a coach about using the POMS, it would be difficult to say how to use to the POMS results. I would not be confident in saying that elevation on any one particular subscale was predictive of overtraining, or indicative of poor recovery during taper, or related to performance in any way. From the results of this study, with only ten participants, the authors seemed to suggest that one might be able to use mood disturbance to predict performance outcomes after taper. This suggestion, however, was based on a significant correlation between only one subscale of the POMS and change in swimming

performance, when all other subscales and the global mood score showed no significant associations to performance.

Attempting to clarify some of the disparity in the POMS and overtraining research, Martin et al. (1999) examined the usefulness of the POMS for monitoring training stress in 15 cycling athletes in a well-controlled, prospective study. Martin et al. presented both group patterns and individual patterns with respect to POMS profiles, and tested links between POMS scores and precise performance parameters. The researchers found that neither the group global mood disturbance scores, nor any of the subscales, changed significantly in response to increases in training, or following a taper period. The global mood disturbance tended to increase for the group following the heaviest weeks of training, but this increase was not statistically significant. With respect to individual analyses, Martin et al. reported that there were no distinct patterns between mood profiles and performance outcomes, during training or after taper. Among athletes who had favourable POMS profiles, some had good performance outcomes, and some had poor performance outcomes. Among athletes who had negative POMS profiles, some had good performance outcomes, and some had poor. Out of the 15 cyclists in the study, two were classified as overtrained according to the criteria that performance became suppressed and remained suppressed despite apparently adequate recovery. Martin et al. pointed out that neither the global mood disturbance scores nor any of the subscale scores for these two cyclists appeared unique during the study. Interestingly, one of the *overtrainers* had some of the lowest recorded mood disturbance scores in the final weeks of the study; whereas, an athlete with somewhat elevated global POMS scores had his best performance during the taper. The researchers concluded that the POMS was “not useful for differentiating whether the cycling training program represented productive overreaching or

counterproductive overtraining” (p. 154). Furthermore, Martin et al. made an appeal to carefully consider the choice of dependent measures in overtraining research:

The primary goal of training for most coaches and athletes is performance. Psychological and physiological changes during high-intensity training are, therefore, primarily of interest for monitoring training stress when they are related in some way to performance. Without performance measures it is difficult to establish whether “mood disturbances” indicate overtraining or instead, that overreaching is going as planned. Using predictor variables (e.g., POMS scores) as dependent variables instead of performance outcome (the real dependent variable of interest) may lead to statistically significant findings, but those findings may be of little value to coaches and athletes interested in optimizing training strategies on an individual basis. (p. 154)

Although the Martin et al. study looked at a small sample of athletes, and results might differ when larger samples of athletes are tested, the researchers have set a standard for more rigorous testing of psychological and physiological parameters in the context of overtraining and sport performance.

Naessens, Chandler, Kibler, and Driessens (2000) examined the relationships among nocturnal noradrenaline excretion measurements and POMS scores in ten high-level soccer players. Attempting to evaluate the utility of nocturnal urinary noradrenaline (NA) excretion patterns in screening for signs of overtraining, Naessens et al. used NA measurements to predict outcomes on the total mood disturbance score of a shortened version of the POMS, as well as on the Fatigue subscale alone. The investigators found that nocturnal NA excretion was moderately predictive of POMS Fatigue scores ($R^2 = 0.53$). Although, the researchers included a measure of performance, however imprecise (mean of weekly rated game performances by two sports journalists), they did not report any links between POMS scores and performance. Furthermore, in contradiction to Martin et al.’s (1999) recommendations, Naessens et al. used the POMS total mood disturbance and POMS Fatigue subscale as dependent measures. What strikes me about this study is that the POMS subscale of fatigue appeared to have been indicative more of physiological

fatigue than of mood disturbance; the consistent reference to mood states as markers of overtraining, therefore, remains to be questioned.

Kenttä, Hassmén, and Raglin (2001) used a 7-Item version of the POMS called the Training Distress Scale, derived from previous research (Raglin & Morgan, 1994), to determine the incidence of overtraining syndrome (referred to in the study as *staleness*) in a group of 272 young Swedish athletes. The researchers asked the athletes to respond to a precise question regarding their experiences of staleness at some point in their careers, and then instructed them to complete the TDS according to how they recalled feeling at different stages of their training (easiest, average, and heaviest levels of training), as well as how they felt during the periods of *staleness*. The authors reported increases in mood disturbance following increases in training intensity, with recalled TDS values significantly higher for athletes during periods of *staleness*. Kenttä et al. stated that the “results are consistent with previous research indicating that mood disturbance consistently increases during hard training with stale athletes exhibiting greater mood disturbances than healthy individuals who undergo the same training” (p. 464). With the retrospective approach in this study, there were no reported measurements of performance, nor links made between mood scores and performance. There were also no reports of individual patterns of mood disturbance and how such patterns related to training and performance. With the large numbers of athletes used in this study, it appears that, on average, athletes recalled an association between mood and training intensity and recalled experiences of performance decrement, but it is not clear if such recall accurately reflected the individual athletes’ moods and overtraining experiences. Although it may be very helpful to begin to get a picture of overtraining using retrospective introspection, one cannot draw any firm conclusions from such a method of data collection.

In a recent study, Pierce (2002) investigated the links between POMS scores and training volumes across a 24-week season in 29 collegiate swimmers. Pierce reported significant, albeit moderate, correlations between training volumes and several POMS subscale scores (i.e. Anger, Vigour, and Fatigue). No significant correlations were found between training volumes and global mood scores, or the remaining subscales, Tension, Depression, and Confusion. Furthermore, the anger subscale was negatively correlated with training volume, a result contrary to the expected direction. No performance parameters were reported in this study, and, therefore, the author made no links between POMS scores and performance.

Halson, Lancaster, Jeukendrup, and Gleeson (2003) examined changes in several physiological and psychological parameters, including the POMS, for a group of eight endurance-trained cyclists over a six-week training protocol. Although researchers gathered data on a number of objective performance parameters, there were no links reported between POMS scores and performance; rather, POMS scores were treated as dependent measures, indicative of states of overreaching or overtraining. It appears as though researchers have continued to refer to POMS scores as unequivocal markers of overtraining, despite the apparent lack of clarity in POMS/OT research results.

Broadening the focus in OT research from mood disturbance to multiple behavioural and situational measures, Kellmann, Altenburg, Lormes, and Steinacker (2001) investigated the use of the Recovery-Stress-Questionnaire for athletes (RESTQ-Sport, Kellmann & Kallus, 2001) as an alternative to the POMS for evaluating the impact of athletic training. The RESTQ-Sport was constructed to measure the frequency of current stress and recovery-associated activities from multiple perspectives (i.e., emotional, physical, and social), addressing a more complete picture than the POMS of athletes' experiences with training and overtraining processes. Kellmann et al. looked at response

patterns on the RESTQ-Sport and the POMS, and at performance changes among 54 German Junior National Team rowers over six weeks leading up to the Junior World Championships. Similar to previous POMS research, the authors reported a dose-response pattern between RESTQ-Sport scores and training loads; unfortunately, also similar to previous POMS research, the researchers did not test or report statistical links between RESTQ-Sport scores and performance. Nevertheless, the research on the RESTQ-Sport is very recent and it may just be a matter of time before the RESTQ-Sport is tested rigorously in association with meaningful performance parameters. Kellmann et al. pointed out the advantages of the RESTQ-Sport in applied settings in terms of providing much more information about athletes' behaviours, stressors, and recovery states, than the POMS:

For the POMS, we have the “iceberg profile,” which primarily consists of negative mood states and only one aspect dealing with positive states of mood, while the RESTQ-Sport gives us a detailed picture of the athletes' state [sic]. Concrete solutions to current problems can be derived from the up-to-date recovery-stress profile and this profile might obviously be used to derive specific intervention strategies. . . . The RESTQ-Sport provides coaches, sport psychologists, and athletes with important information during the process of training. (p. 163-164)

Although the efficacy of the RESTQ-Sport for predicting performance has yet to be established, it seems that it could be a useful tool at the individual level to provide important parties with information about how athletes may or may not be coping with a training program.

Taken as a whole, the POMS in OT literature does not provide a clear picture of what is going on with mood states and performance during intense training and competition. It seems that it may be important to monitor psychological variables in athletes, while they are training intensely, in order to identify areas where athletes may not be coping with training loads, and to provide information in addition to performance and physiological measures for coaches and others. The POMS has not proven to be a reliable tool for predicting how athletes will perform after a cycle of training and recovery;

although, it may still have some clinical utility for opening a discussion between, for example, a sport psychologist and an athlete, with a significantly elevated mood disturbance score. The RESTQ-Sport might be an important step to developing a more holistic picture of an athlete's psychosocial and physical responses to training and recovery; nonetheless, the predictive capabilities of RESTQ-Sport for performance outcomes remain to be established.

Comments on the Research

With respect to markers and diagnosis of OT, researchers have noted that none of the hypothetical markers for OT syndrome is unequivocal (Armstrong & VanHeest, 2002), and a recent "critical review of existing scientific literature leads to the disappointing conclusion that the tools available for overtraining syndrome diagnosis have not improved much in the last years of overtraining research" (Urhausen & Kindermann, 2002, p. 100). Although the physiological assessment research is an invaluable contribution to the body of knowledge on OT, some of the equivocality in research findings may have resulted from adherence to a dose-response model of training and recovery (Morton, 1997). From this perspective, it is assumed that, if the body is pushed too hard with high workloads (*dose*), physiological and psychological disruptions will occur (*response*), from which an athlete needs time to recover. The dose-response model, however, puts the focus mostly on what is happening with the training load (or dose), excluding some issues significant to OT, such as individual differences in stress tolerance, existence of multiple stressors beyond the training program, and potential causal mechanisms driving the maladaptive OT behaviours. Furthermore, often the responses that are being measured (physiological or psychological markers, or performance decrements) have turned out to be inaccurate indicators of OT. Although it would be useful for coaches, athletes, and sport scientists to have a precise selection of specific markers that would indicate when an athlete is

beginning to overtrain, the processes underlying athletic training, recovery, and OT, appear to be too complex to be measured easily. Nonetheless, more recently, researchers have moved to a more holistic view of the training process looking at the balance between stress and recovery (Kellmann, 2002; Kenttä & Hassmén, 2002), emphasising the recovery aspects of training, and assessing many aspects of athletes' lives, both inside and outside of physical training.

With respect to the psychological assessment research, some researchers have argued that psychological testing is the most effective in detecting OT at an early stage (Kellmann & Günther, 2000; O'Connor, 1998; Shephard & Sheck, 1994). Nonetheless, similar to the physiological research, the results of psychological assessment research, especially POMS research, have proven equivocal, as many of the markers have also been associated with intense training that did not lead to performance decrement (Rowbottom et al., 1998). Steinacker and Lehmann (2002) stated, "performance is the most important parameter for monitoring training adaptation. Maximum performance during a standardized test is therefore the gold standard for evaluating exercise capacity and monitoring training" (p. 107). Along these lines of emphasising performance, Kaplan (1990) put forward an important message about behavioural outcomes in health care research and delivery that is relevant to OT contexts. He pointed to behaviour as the central outcome for health care, asking if patients could improve on practical things in their lives, such as walking, talking, or caring for themselves, as the result of some intervention. In the OT context, Martin et al. (2000) commented on Kaplan's emphasis on behavioural outcomes, stating the following:

This same focus on behavioral outcomes should apply to overtraining research. Changes in POMS scores and physiological variables are only of interest to the coach and the athlete if they relate to performance. If POMS scores or blood chemistry (e.g., cortisol levels) change significantly over the course of an intense training program and taper, they are of little practical interest to coaches and athletes unless they are related to the outcome of interest, performance. (p. 142)

Some researchers (Martin et al., 2000; Rowbottom et al., 1998) have suggested that methodological flaws, such as conducting overload training research without a taper and not measuring performance and OT markers after a taper, may render many supposed OT markers as no more than indicators of current training load. Without knowing what happens to performance after taper, one cannot say anything more than the assessment markers are good indicators of intense training (e.g., a negative POMS profile or skewed physiological assays associated with intense training loads before taper could be associated with either performance improvement or decrement after taper, depending on the individual).

Psychological and physiological assessment might continue to prove useful in applied settings to inform athletes and coaches when *something* is going on in athletes' lives, in terms of stress or recovery responses to training. Future research, however, could be directed at uncovering causal antecedents of, or risk factors for, OT. Moving away from the dose-response approach, and with the emphasis on stress/recovery balance as described in their conceptual model, Kenttä and Hassmén (2002) have helped initiate the move to more holistic understanding of athletes' experiences with OT. Several researchers (Kellmann, 2002; Kenttä & Hassmén, 1998; Meyers & Whelan, 1998; Raglin, 1993) have emphasised the individual differences among athletes in response to training and life stressors; further research into the meanings, experiences, and causes of OT among different athletes could, thus, prove fruitful.

Overtraining Experiences and Risk Factors

Although there have not been qualitative studies conducted specifically on OT risk factors, interviews with, and case studies and observations of, athletes by researchers have provided hints about what the OT experience is like for athletes, and what kinds of personal and situational variables add to the stress loads that put them at risk for OT and

injury. In the following sections, I outline perspectives on the personal and situational variables, affecting athletes' training and recovery, from both experts, mostly researchers and coaches, and athletes.

Expert Perspectives

Researchers in a large number of OT studies and review articles have made anecdotal comments about the potential risk factors for overtraining, and in some cases have presented interview data that suggests potential OT risk factors. Krane et al. (1997) reported that an elite gymnast who overtrained was characterized by disordered eating, high levels of ego-involved goal orientation, perfectionism, a win-at-all-costs attitude, maladaptive responses to failure (e.g., increasing an already excessive training load), and an ability to rationalise excessive training practices. The gymnast also was surrounded by parents and coaches who always pressured her to win and supported her rationalising and other maladaptive behaviours. In an interview study, Gould et al. (1997) identified overtraining as a major contributing factor to *burnout* in junior tennis players, where one player who overtrained was characterized by a high level of perfectionism and unrealistic expectations, and was subjected to elevated parental criticism, expectation, and emphasis on winning. Gould et al. observed that this athlete believed that increasing her training load when it was already very heavy was the only route to success. They also discovered that a second tennis player who overtrained did not report such high levels of perfectionism or parental pressure as other players, but displayed a profile suggesting "super-motivation" combined with unrealistic goals. Gould et al. reported that this second tennis player held the belief that hard work, rather than talent, would bring him success. Finally, in an interview study of Olympic athletes, Gould et al. (1999) revealed that, among many athletes who identified overtraining as a major contributor to their failures, lack of good coach-athlete communication and poor timing of selection processes were cited most

commonly as damaging factors. Other researchers have noted similar qualities among athletes they have observed and have commented on circumstances that may put athletes at risk for overtraining (e.g., Kenttä & Hassmén, 2002).

Fry, Morton, and Keast (1991) stated, “lack of recovery time in the training schedule is the most important risk factor for overtraining” (p. 123). There may be many factors, however, that affect recovery. For some athletes, the training stimulus may be the most important factor affecting recovery, if the workload is of a high volume and intensity. For others, factors outside of training may impede adequate recovery, such as work, school, or family commitments. Lehmann et al. (1993) suggested that it is important to look at each athlete individually, stating that “inter-individual differences in recovery potential, exercise capacity, non-training stressors, and stress tolerance may explain the different degrees of vulnerability experienced by athletes under identical training conditions” (p. 25). There also may be subtle influences on attitudes towards, and behaviours surrounding, recovery, such as coach and parental input, sport culture pressures, or attitudes of peers, training partners, and other athletes. Brustad and Ritter-Taylor (1997) noted that coaches and others frequently endorse attitudes, such as *no pain, no gain* and *more is always better*, which create cultures of risk instead of promoting self-awareness. Kenttä and Hassmén (2002) noted that sudden increases in non-training stressors add to the total stress, which can reach a level where a person experiences a lack of recovery; therefore, overtraining can occur even during moderate levels of physical training, if there are coexistent high levels of psychosocial stress.

Botterill and Wilson (2002) observed that “guilt about not working hard enough and being intense all the time” (p. 144) often appear to be important risk factors for overtraining, and can impede recovery and rehabilitation. Circumstances, such as the lead up to, or the time following, big competitions may also increase the risk of overtraining,

possibly due to the addition of heightened mental and emotional demands to the already existing physical demands of preparing for, and performing in, competitions (Botterill & Wilson, 2002). Botterill and Wilson also recognised the potential harm of emotional build up, commenting that “repressed, denied, or unprocessed emotions” can be sources of conscious and unconscious conflict and stress (p.150).

Kellmann (2002) noted that sometimes a simple change in environment can have a profound effect on an athlete’s recovery:

If an athlete's accommodation is close to a loud street, her rest may be disturbed day and night. However, if an athlete is used to living in a loud neighbourhood, she might have no problem sleeping through loud noises, but instead may get irritated by an absolutely quiet environment. (p. 9)

Kellmann (2002) suggested that a disruption of sleep also can be a direct result of emotional disturbances in an athlete’s life, such as family or relationship conflicts.

Kellmann recognised that although athletes can compensate for a lack of sleep, or other recovery activities in the short term, without addressing the lack of recovery, they will eventually risk developing an overtraining syndrome in the long term.

In many sports, competitive environments and intra-team rivalries can lead to disruptions in recovery, exemplified in the following anecdote, cited by Kellmann (2002):

The coach of the Canadian male speed skating team planned a training schedule that included a day off as the key element for recovery purposes. The coach did not tell the athletes what to do for recovery, so they decided to go for a bike ride in the mountains. The purpose of the bike ride was to relax, be with the team, and get refreshed by the scenery of the Canadian Rocky Mountains. However, the athletes soon turned the relaxing bike ride into a competition that left no room for physiological recovery at all.

. . . Since the athletes knew that the coach would not appreciate their bike ride competition, they did not tell him, and the next day practice continued based on the regular schedule. The next physiological stressor was set, and some days later the coach was surprised by the performance decline. (p. 9)

Kenttä and Hassmén noted that although the athletes in this anecdote may have experienced some social recovery from the fun ride, their competitiveness resulted in a physiological stressor that could have disrupted the program prescribed by the coach. In

this example with the speed skaters, the coach appeared to be unaware of the risk for OT; in other cases, however, coaches might even acknowledge that they are risking OT with aggressive approaches to training, illustrated by the following quote from Gould and Dieffenbach (2002):

If five is good then 50 is better . . . The year before the Olympics, they (my athletes) would do sets of 50 jumpies and this year they are doing sets of 700 jumpies. If I can push them more and more, when they finally get there, they will be great. However, this pushing can blow up in your face -- like you finally get to the Olympics and are exhausted. (p. 26)

From this particular quote, one can identify the stereotyped *more is better* approach promoted by this coach.

Similar to comments by Fry et al. (1991) about lack of recovery, Hanin (2002) described risk factors for OT in terms of barriers to effective recovery and rest. He suggested that athletes and coaches may underestimate the importance of systematically matching workload with adequate rest, and pointed out that this underestimation may be reinforced by the values held by some sport cultures, subcultures, and athletes, where quantity (intensity, and volume) is emphasised over quality. Hanin also observed that athletes' responses to their own performances can affect how they balance training and recovery, potentially motivating them to push excessively in training. He stated,

In the case of poor performance (underperformance due to fatigue or problems with technique), an athlete continues to work intensively to eliminate uncertainty and to enhance self-confidence. However, athletes usually are unable to break this vicious circle and even do not dare to take a good break and correct this situation. In the case of successful (better-than-expected) performance, an athlete can be so over-excited with positive emotions that he does not notice the signs of fatigue and . . . continues to do excessive work until it is too late. (p. 210)

Similarly, Hawley and Schoene (2003) noted how athletes might display maladaptive responses to poor performance, where frustration with performance may lead athletes to train harder in response to plateaus or declines in performance. Often the problem with the response of increasing training efforts, in the cases where the stress loads are already high,

is that it increases fatigue and results in further decrements in performance, thus initiating a vicious cycle of heavy training, chronic fatigue, poor performance, and frustration.

In summary, the preceding observations, made recently by researchers, indicate that understanding what puts athletes at risk for OT may require looking into many different aspects of athletes' lives, both personal and situational. Although there have been no systematic investigations into OT risk factors, it is possible to summarise the observations made by researchers and experts, thus far. Looking at a number of OT review articles in the literature over the past 15 years, a picture of the factors, as perceived by researchers and experts in the field, that contribute to OT can begin to be developed. On the following pages (see Table 2) I have presented an outline of some of the personal and situational risk factors identified for OT.

Table 2.

OT Risk Factors Identified in the Literature by Researchers

Risk Factor	Sources
<i>Training issues (program & schedule)</i>	
High volume/high intensity training	Brown, Burke, Frederick, Falsetti, & Ryan (1983); Budgett (1990); Derman et al. (1997); Foster (1998); Hollander & Meyers (1995); Kenttä & Hassmén (2002); Kuipers (1996); Kuipers & Keizer (1988); Lehmann et al. (1993); Uusitalo (2001); Wallace (1998)
High training monotony; lack of periodisation	Armstrong & VanHeest (2002); Budgett (1990); Foster (1998); Hollander & Meyers (1995); Wallace (1998)
Failure to include recovery in training program; lack of rest days	Kenttä & Hassmén (2002); Kuipers (1996); Kuipers & Keizer (1988); Wallace (1998)
Sudden increases in training load or intensity (particularly lactate training, and especially following breaks due to injury or illness)	Brown et al. (1983); Budgett (1990); Hooper & Mackinnon (1995); Kuipers & Keizer (1988)
Lack of seasonal lay-offs	Hooper & Mackinnon (1995)
High volume of dry-land or cross-training	Hooper et al. (1995)
Frequent competition, and/or year-round competition	Brown et al. (1983); Derman et al. (1997); Kuipers (1996); Kuipers & Keizer (1988); Wallace (1998)
Transitions in training programs – usually from winter low intensity to spring interval and higher intensity programs	Budgett (1990)
Time of season – especially just prior to competition and during competition; competition & selection	Budgett (1990); Hawley & Schoene (2003); Uusitalo (2001)
New training environment	McCann (1995)
Lack of training program flexibility and individualisation: team sports where coaches do not have leeway to take individual training tolerance into consideration when planning practice; or, individual sports with one training program for all athletes	Hooper & Mackinnon (1995); Levin (1991)
Lack of proper taper	Gould et al (2002); Levin (1991)
Lack of objectivity when athlete is doing their own training, Training without coach or partner, or training with significantly more skilled or physically fit athletes	Brown et al. (1983)
Lack of monitoring for signs of overtraining	Hooper & Mackinnon (1995); Committee on Sports Medicine and Fitness (2000)

Table 2. (continued)

<i>Situational & environmental stressors</i>	
Travel (especially across time zones), jet lag	Gould et al. (2002); Derman et al. (1997); Kuipers (1996); Uusitalo (2001); Wallace (1998)
Changes in training environment, altitude, temperature, humidity	Armstrong & VanHeest (2002); Kuipers & Keizer (1988); Uusitalo (2001); Wallace (1998)
Moving house, or other economic stressors	Beil (1988); Uusitalo (2001)
New national team status	McCann (1995)
Increases in employment workload & other occupational stressors	Armstrong & VanHeest (2002); Kenttä & Hassmén (2002); Kuipers & Keizer (1988); Lehmann et al. (1993)
Poor performance at competition	
Problems and obligations in school, increases in academic workload	Armstrong & VanHeest (2002); Kuipers & Keizer (1988); Kellmann (2002); Kenttä & Hassmén (2002); Lehmann et al. (1993)
Sport specialisation at an early age	Committee on Sports Medicine and Fitness (2000)
Participating at too high a level for ability (especially among youth athletes)	Committee on Sports Medicine and Fitness (2000)
<i>People issues (coaches, parents & others)</i>	
Conflicts with coaches, relationship problems with friends, team-mates, staff or parents	Armstrong & VanHeest (2002); Hollander & Meyers (1995); Kenttä & Hassmén (2002); Kuipers & Keizer (1988); Wallace (1998)
Excessive expectations from a coach or family; unrealistic goals from coach or parents	Armstrong & VanHeest (2002); Hollander & Meyers (1995); Kuipers & Keizer (1988)
Emotional stress from major life events (e.g., illness, conflicts with partners, parents' divorce).	Kellmann (2002); Hollander & Meyers (1995); Kenttä & Hassmén (2002)
<i>Athlete - physical issues</i>	
Premature return from injury	Budgett (1990)
Physical illness, allergies, disease, or infections	Kuipers (1996); Kuipers & Keizer (1988); Raglin (1993); Uusitalo (2001); Wallace (1998)
Poor or inadequate sleep	Derman et al. (1997); Kenttä & Hassmén (2002); Uusitalo (2001)

Table 2. (continued)

Poor or inadequate nutrition; possibly inadequate caloric intake (especially carbohydrates); potential nutrient – vitamin/mineral deficiency, iron deficiency, dehydration	Committee on Sports Medicine and Fitness (2000); Derman et al. (1997); Hollander & Meyers (1995); Hooper et al. (1995); Kenttä & Hassmén (2002); Kuipers (1996); Kuipers & Keizer (1988); Uusitalo (2001); Wallace (1998)
Adolescent athletes during growth spurts; overloading developing bodies	Beil (1988); Committee on Sports Medicine and Fitness (1990)
Athletes with a substantial injury history or experiences with overtraining	Hollander & Meyers (1995); Raglin (1993)
Prolonged amenorrhea in female athletes leading to diminished bone mass	Committee on Sports Medicine and Fitness (2000); Beil (1988)
Low tolerance for physical and/or psychological stress loads (predisposition); poor recovery potential	Kenttä & Hassmén (2002); Lehmann et al. (1993); Uusitalo (2001)
Athletes at their physiological peaks are on the threshold of overtraining	Armstrong & VanHeest (2002)
<i>Athlete - beliefs, behaviours, & attitudes</i>	
Success – rapid rise in sport to the elite level (especially for young athletes); new PBs may cause athletes to believe that training harder will bring them even greater success	Budgett (1990); McCann (1995)
Unrealistic role models - athletes may compare themselves to and try to keep up with faster, better skilled athletes – or comparison to successful others who train at high volumes, beyond the current capacity of the athlete	Brown et al. (1983); Budgett (1990)
Desperation in response to mediocre performance	Budgett (1990)
Very high levels of motivation to achieve success; motivation to set a new standard (e.g., world record)	Budgett (1990); Hollander & Meyers (1995); Kuipers & Keizer (1988); Levin (1991)
Maladaptive responses to underperformance (e.g. increasing training load or not decreasing other stressors when loads are already high)	Foster (1998); Kenttä & Hassmén (2002); Raglin (1993)
Belief that feeling fatigued is equivalent to being unfit, requiring increases in training (when training loads are already high)	Levin (1991)
Unrealistic goals set by athlete	Hollander & Meyers (1995)
Fear of failure	Kuipers & Keizer (1988)
Personality structure – ongoing personal or emotional problems	Hollander & Meyers (1995)
Difficulties with time management (practice/school/friends)	Kellmann 2002
Fear of being under-trained – <i>more is better</i> philosophy	Brown et al. (1983); McCann (1995)

The summary presented in Table 2 illustrates many of the variables that may arise in relation to risk for OT. Some of the factors seem obvious, such as high volume/intensity training and/or inadequate recovery. Other factors might not be so obvious, such as an athlete being at risk when at a physiological peak, highlighting the importance of gathering as much information as possible about athletes when assessing the risk for OT.

Athlete Perspectives

In addition to the expert perspectives on OT, many athletes have talked about their experiences with stressors by which they were confronted during training and recovery. In several different studies and reviews related to OT, researchers have presented direct quotations from athletes, illustrating some of the experiences with high pressure situations, pushy coaches, and over-involved parents, as well as some of the athletes' own attitudes toward training and recovery.

With respect to situational variables, the coach seems to have a significant influence on how hard athletes push in training, how they pursue and experience recovery activities, and how they feel about themselves, emotionally and physically. Some athletes are aware that their coaches may push too hard, risking adverse outcomes, illustrated here by an athlete quoted in Gould and Dieffenbach (2002): "My coach is a real pusher, to the point where I think he pushes too hard. I think I would be better if I did not train as hard" (p. 25). Athletes might be aware of their coaches' behaviours; nonetheless, the following excerpt from Krane et al. (1997) illustrates how an athlete will continue to follow the, often abusive, practices of her coach despite being aware of the negative impact:

[Coach 2 had an] extremely different concept. This woman, Russian born, would place bottle caps on the bottoms of your feet; if you fell on your heels off the balance beam, then you would have them, the Pepsi bottle caps, go into your heels. [She was] excruciating, die-hard; she was wonderful. You either love her or hate her. I was a person who loved her because she made me so infuriated sometimes and because she was good, and that's why I liked her. (p. 59)

The young gymnast quoted here expressed some major contradictions in the way she viewed her coach, *excruciating*, yet *wonderful*, *infuriating*, yet *likeable*. From the description of the coach-athlete situation, it appears that this gymnast was trapped in a dynamic with her coach where she would do anything that the coach said, no matter how difficult or abusive; it sounds like a situation that was very high risk for OT.

In some cases, coaches might not account for individual difference among athletes in training and recovery capacities, exemplified in the following athlete quote from Wrisberg and Johnson. (2002):

I think the coach failed to see the individual needs of players. Some people just couldn't practice for three hours in 90-degree heat. It got to them. Quite a few were sick, off and on, and half our team was injured. (p. 264)

In other cases, athletes have reported that their coaches were simply abusive. The following quote from Wrisberg and Johnson (2002) illustrates how an abusive coach denigrated her athletes:

All [the coach] knew how to do was bitch at us. She made us feel like we were fat... real big. She called me names and told me how mentally disabled I was. She had something for everybody -- I just happened to be the retarded one in her eyes. She liked to make cracks about our bodies. We were already pretty self-conscious about being big. So around her, we always felt so fat -- just horrible and ugly. And the uniforms didn't help us one bit because they were real short... We just never felt very good about ourselves and she had a lot to do with that. (p. 264)

The emotionally charged environment described above could prompt some athletes go to extremes in either training, eating behaviours, or other potentially harmful activities. Other forms of abusive behaviour by coaches include pressuring athletes to perform when they might be unfit to do so. Wrisberg and Johnson (2002) noted that, as an outcome of OT, injury poses a serious threat to the long-term well-being of athletes, especially when coaches do not handle injured athletes well. They quoted one athlete who stated, "When I had that groin injury [the coaches] made me scrimmage anyway... I mean, I had no business being out there" (p. 258). The coaches' attitudes and behaviours toward injury

appear to be a significant risk factor for OT and re-injury, exemplified in the following quote from a gymnast (Krane et al., 1997):

[Coach 1] would get mad if I got an injury. He would be so pissed off. He'd be like, 'oh no, not again,' and then he'd want me in the gym working out and everything. . . [He] thought that [an injury] was a lack of concentration. So, he was mad at me because, if I was concentrating better, I wouldn't have [gotten injured]. (p. 59)

For some athletes, coaches in conflict with one another can add to the stress load already experienced in the training environment: "There was miscommunication between the coaches; coaches were yelling at each other... it was really disorganized and it had a negative impact on me and the other players" (Wrisberg and Johnson, 2000, p. 264).

Coaches play a significant role in the way athletes respond to the training environment and make decisions about recovery; given many of the previous examples, it appears that coaches may increase the risk for OT depending on how they interact with their athletes.

Athletes may feel that they do not have enough, or any, opportunities for down time away from their sport. Reflecting such feelings, Gould et al. (1997) provided the following quote from an athlete

My biggest problem was there was no separation between the role of the father and the coach. So you wouldn't talk about anything else but tennis whether we were eating or if there was a match on television everyone had to watch it and he'd comment, and whether or not you agreed with him, it didn't matter 'cause, you know, he was always right. You had to do it this way and, you know, he always made us do certain exercises when he wanted and was very strict on getting things done the way he thought, and he didn't leave any room for personal feelings. (p. 265)

Another significant stressor for athletes can come from the demands inherent in the sport culture. For example, in figure skating, athletes might feel extra pressure to train harder or experience stress that disrupts their recoveries, because of the constant concern about appearance:

You should do a whole story on weight in figure skating; it is such an appearance sport. You have to go out there with barely anything on... it's not like I'm really skinny or anything, but I'm definitely aware of it. I mean I have dreams about it sometimes. So it's hard having people look at my thigh and say, "oops, she's an

eighth of an inch bigger, " or something. It's hard to do. Weight is continually on my mind. I am never, never allowed to be on vacation. Weight is always on my mind. (Gould, Jackson, & Finch, 1993a, p. 149)

This type of concern about appearances and weight, ostensibly, may lead athletes to push harder in their training, neglect important recovery strategies, especially those related to nutritional intake, and, thus, put themselves at greater risk for OT and its negative outcomes.

There often may be situational stressors outside of the sport and training environments, as well, that put athletes at risk for OT. In some cases, friends can be significant sources of stress, noted here in a quote by an athlete from Wrisberg and Johnson (2002): "My roommate is one of those people who seems to need some sort of chaos in her life all the time. I just become a victim of the chaos she needs in her life. I dread going home at night" (p. 260). In other cases, athletes, such as the following one quoted in Wrisberg and Johnson (2002), may experience their significant relationships to others as contributing to the overall stress load: "My relationship with my girlfriend was such a roller coaster. She'd let me in close and then just push me away. It just about drove me crazy" (p. 262). For some athletes, the family financial circumstances can elevate already high levels of stress: "My family was always under financial burdens, sacrificing everything so I can skate. We didn't have the money, and things are going really bad, and it was like... caused a lot of tension, you know" (Scanlan, Stein, & Ravizza, 1991, p. 114). For other athletes, family crises may become overwhelming. Wrisberg and Johnson (2002) provided the following quote from an athlete, illustrating a particularly difficult home environment:

My father had gotten laid off, you know, from his job and everything and that was really tough on my family and all that... that's when he started his drug use, he started experimenting with the "crack." He and my mother weren't getting along and my sister was just a teenager and had no guidance from my folks at all. It was just awful (p. 261).

In such cases where athletes go home to stressful situations and relationships, the overall stress loads are increased, and the capacities for recovery diminished, contributing significantly to OT risk.

OT risk might also increase when athletes experience stress or feel pressure from the expectations of others around them. Gould et al. (1993a) presented the following excerpt, illustrating an athlete's perception of expectations:

Expectations are definitely a concern and they are not a superficial one. Will I measure up to other people's expectations? It is much easier when you don't have any expectations, because if you don't do very well, people just don't notice you; you can always do better next year. But if you do bad with expectations upon you, they condemn you, so that's a stress factor. (p. 147)

In other cases, athletes might perceive excessive pressure coming from an institutional level, illustrated in the following athlete quote from Wrisberg and Johnson (2002):

The athletic department standards are so high here. The beginning of the season we came home from our first road trip and we were ashamed to tell people we lost. We felt like we let the whole department down. (p. 263)

In yet other situations, athletes might find that the presence of more experienced or talented athletes can create overwhelming stress, as one college swimmer from Wrisberg and Johnson (2002) described it:

I went to NCAA's and it was unbelievable the people I saw there. It was huge names in swimming and I felt so out of place... like I didn't belong in the same pool with them. I had a really bad asthma attack and I think maybe part of that could have been the anxiety. I was completely psyched out. (p. 263)

In all of the above scenarios, the expectations of others, or the pressure from comparison to others, can add to the stress load from which athletes need to recover. For some athletes, this added pressure may also lead to pushing excessively in training in order to compensate for perceived shortcomings.

With respect to personal variables, it seems that certain attitudes, personalities, and personal experiences may elevate stress levels in athletes, prompt excessive training practices, interfere with recovery, or put them at greater risk for injury. Although

motivation to train hard may be important in sport, some athletes at risk for OT seem to display super-motivation, wanting to succeed so badly they are not aware of their own limits. A college tennis player voiced his concern about a team-mate's seemingly excessive level of motivation (Wrisberg & Johnson, 2002):

One guy on the team doesn't know when to stop with his training. He's a great guy but he works too hard and now he has a stress fracture in his back. Last year he broke a foot. He goes too much. He wants it too bad. (p. 258).

Athletes at risk for OT may also express concern about taking time off, despite that regular recovery should be an integral part of a training program. With the following athlete quote, Wrisberg and Johnson (2002) provided an example of a college distance runner expressing the irrational thought that rest is a sign of weakness:

I feel like I'm weak if I decide to take a day off. It's like, I'm not, you know -- I set pretty high standards, you know -- if you can't get out there and run, then what are you doing running [NCAA] Division I track? (p. 258).

Although many athletes may be described as having perfectionist tendencies, it seems that, at the more extreme end of those tendencies, athletes may react maladaptively to their performances. The following comment by an elite figure skater shows how perfectionist thought processes might create frustration for the athlete: "I was a perfectionist That's probably the hardest thing; I was just a perfectionist all the time. . . . I would never accept myself not doing it perfectly" (Scanlan, Stein, & Ravizza, 1991, p. 115). At the extremes of perfectionism, some athletes will show great dissatisfaction with anything less than winning. Krane et al. (1997) illustrated how a gymnast, with extreme perfectionist tendencies, could become incredibly self-deprecating in response to any performance that did not result in a win:

I would be like, 'all of that hard work is down the drain and here you are in 3rd place. You are such an idiot. You are so low; I cannot believe you are here; you are supposed to be up there.' . . . I pictured 2nd or 3rd to be, I don't know, what I pictured as a loser. I only knew how to envision a winner because a loser was not even, was not in my world. That picture may be weird but that's the way it was. It was just tops; everything's always gotta be the top. (p. 63)

For other athletes, displaying obsessive-compulsive types of behaviours in sport could lead them to poor decisions about life choices that increase stress, disrupt recovery, or threaten their health. One college swimmer admitted turning to substance abuse as a coping strategy, exemplified here in the following quote from Wrisberg and Johnson (2002):

One year I didn't perform well at all. I felt like I was missing something. I wasn't really part of the team. That's when I started drinking. I don't know this just my personality being kind of obsessive-compulsive... once I started to drink, I couldn't stop. (p. 265)

Athletes at risk for OT and injury may also display unhealthy attitudes toward training, sometimes engaging in excessive, damaging practices. The following quote from a gymnast (Krane et al, 1997) illustrates the extent to which one athlete might go in self-damaging thoughts and behaviours:

In my mind, practice made perfect. I had believed that pain is gain. . . . And the more it hurt, the better it was; and I don't know why it was like that, and sometimes I think about that and I think I was becoming psychotic, but I would purposely hurt myself to make myself better. To almost make myself feel like I was existing. (p. 65)

Evident in the previous quotations from athletes, there appear to be numerous sources of stress and driving factors in athletes' lives, which may add to the total stress load, prompt poor decisions about training and recovery, and push them over the edge from healthy training to OT. In some cases, it seems that athletes might feel pushed by coaches or parents; in other cases, the pressure, and/or maladaptive behaviours, may be driven by the athletes' own personalities. Understanding a complete picture of athletes' lives seems to be an important step in minimizing the risk for OT.

Summary of Risk Factor Research

As many researchers have remarked, Armstrong and VanHeest (2002) stated, "the border between optimal performance and a performance impairment due to overtraining is subtle" (p. 341). Such subtlety might prompt exploration at an individual level to gain an

understanding of the meaning of overtraining experiences for athletes, including *why* athletes may risk overtraining or neglect their recovery. It seems that understanding risk factors for OT might be enhanced by a holistic approach that encompasses fleshing out the many factors, personal and situational, affecting athletes' lives. Botterill and Wilson (2002) stated, "since the phenomena involved in overtraining and recovery are clearly multifactorial, qualitative descriptive case studies and research can assist us in understanding the complex relationships involved" (p. 143). From the above examinations of the literature, it appears there have been a number of qualitative studies, and several review articles, that have initiated investigation into overtraining risk factors, providing data from both experts' and athletes' perspectives; it seems that the time is right for further in-depth, qualitative research into OT phenomena.

Conclusions of Literature Review

Gould and Dieffenbach (2002) stated that, "it is evident that researchers must look beyond mere physical training as a cause of overtraining and burnout . . . Other factors such as psychological stress, inadequate rest, the type of recovery activity, travel, personality, and sociological issues must be examined in multifaceted models" (p. 33). Furthermore, Kenttä and Hassmén (2002) noted that, "only the individual athlete knows exactly in which way the training affects her body and mind and how she perceives recovery actions" (p. 67). Therefore, it could be useful to conduct more research that looks at as many variables as possible in athletes' lives, and that provides insight into the individual athletes' experiences from the athletes' perspectives.

Kenttä and Hassmén (2002) noted the difficulties with holistic research approaches: "it may be frustrating to include and consider the individual's whole life situation" (p. 67). Nonetheless, in stating "performance development and optimal training depend heavily on the ability to integrate and react to as many relevant variables as possible" (p. 67), they

supported the rationale for an idiographic approach to examining athletes' experiences with OT and outcomes. Kenttä and Hassmén also stated "more research is needed in order to help establish to what extent psychosocial stress interacts with training-induced stress in the development of the overtraining syndrome" (p. 73). With such research, one may be able to "increase the understanding of why the same athlete responds differently to a given training stimulus under different conditions, why homogeneous groups of athletes display different responses to a given training stimulus, and why some athletes seem to be more vulnerable to staleness" (Kenttä & Hassmén, 2002, p. 74). There is an implicit demand here to understand the individual, providing the rationale for in-depth studies of individual athletes' experiences with overtraining processes and outcomes. This thesis is about gathering information on, and identifying, the many relevant variables, available cues, and early warning signs connected to overtraining processes and outcomes.

Susceptibility to overtraining and potential risk factors, has been identified as an important area for research, especially the focus on individual differences (Flynn, 1998; Raglin, 1993; Uusitalo, 2001), and some researchers have suggested a number of personal and situational risk factors for overtraining (Gould et al., 1999; Gould et al., 1997; Krane et al., 1997; Uusitalo, 2001). There is no published research, however, that has been conducted systematically to uncover, understand, and test such potential risk factors. Currently, many top coaches and athletes appear to have access to sport science knowledge that may enable them to minimize or avoid OT. Nonetheless, many athletes are still pushing too hard and are at risk for serious OT outcomes. Idiographic research that is directed toward revealing what is being experienced at the individual athlete level could be helpful in presenting a more complete understanding of the OT process, including the risk factors, actual causes, and potential consequences.

It may be important to identify predisposing personal variables of athletes, and

situational variables experienced by athletes, that are present before a particular training cycle commences. It then might be possible for athletes, coaches, doctors, and sport psychologists to be more sensitive to the risk factors and act to minimize negative outcomes. Flynn (1998) and Raglin (1993) have suggested that future research should examine susceptibility to overtraining. Raglin and Morgan (1989) found that, among college swimmers, 91% who became stale in their first season became stale in one or more subsequent seasons, whereas, only 30% of the swimmers who did not become stale during their first season developed staleness in another season. Raglin (1993) concluded that this finding “suggests that athletes display consistent differences in their propensity toward becoming stale by the age of 18 and indicates that some individuals are at greater risk of suffering the disorder than others” (p. 843). O’Toole (1998) has stated that the individual variability in responses to a given training load is such that a particular training load that is optimal for one athlete may lead to overtraining syndrome in another; it could be important to ask what are the sources of this variability. With OT potentially affecting athletes in most sports, it could be important to examine personal and situational factors that lead to OT and help predict susceptibility to OT. Identifying which athletes are at higher risk for OT and its negative outcomes could be one of the first steps toward prevention. Perhaps, with more research on risk factors, it might be possible to predict what types of situations are most likely to lead to overtraining and what types of people in certain situations are most likely to overtrain.

CHAPTER 3: MY INTEREST IN AND EXPERIENCE WITH OVERTRAINING

My Story of Overtraining

To initiate the examination into the meanings of overtraining for athletes, and to understand some of the direct and indirect drivers of overtraining behaviours and processes, I realised that a good way to start would be to look at my own competitive sport experiences.

I have been an athlete for much of my life, as an elite rower, professional windsurfer, and as a competitor in road and track cycling and several other sports. Before embarking on my PhD journey, I had believed that I had never overtrained at any time in any of my sports. In my initial review of the OT literature for my PhD proposal, however, I started to identify issues that seemed to be related to my experiences as an athlete, especially as a rower. In rowing, I had been training from 1997 to 1999 to go to the Sydney Olympics, and I had been in a good position to make the Canadian team. Unfortunately for me, I sustained a serious wrist injury in 1999, ending my hopes of competing at the Sydney Games. While I was training, I had been aware of OT issues, but thought that I kept them under control. At the time of my injury, I did not consider it to be a result of OT, but rather a result of an error made in lifting too heavy weights. Nonetheless, during the following year, with my exploration into OT, I began to identify my training practices, attitudes, and beliefs as indicative of OT behaviour. I recall that preceding my wrist injury, I had basked in feelings of invincibility; I had been on a high of super-motivation, and I had set short terms goals to break through new anaerobic and aerobic barriers, which looking back, had been unrealistic given my timeframe. Just before the injury, I had returned to full training after a break for Christmas, and I had increased my training load upon my return by twenty-five percent (from 12 workouts per week to 16 workouts per week). Looking at my thoughts and behaviours now, I feel a bit ridiculous that I could not see that I was setting

myself up for disaster, but it seemed that I had to go through the whole OT experience to have a sense of what it was all about.

As a researcher, I recognised my own experiences as overtraining, and I wanted answers to a number of questions: I had good knowledge about training and recovery needs, about nutrition, about sport science; why did I take risks and push that extra bit harder when I knew it could be detrimental? What was getting me to the position where I was tired, but did not want to tell my coach? Why did I not want to share my goals with others? It led me to thinking that there is a lot going on at the intrapsychic and interpersonal levels that is not being tapped by the current research. I hoped that I might conduct research that could answer these questions for me, as well as answering questions that other athletes might have about their own experiences with OT.

Maybe I should have stopped after my first experiences with OT and injury, but I could not let go of the feeling that I had been so close to the Olympics and had not made it; I had to try again. I had another chance to try out for the rowing team in 2003, this time backed by my research experience, increased personal insight, and lessons from my previous disappointment. I took a leave of absence from my PhD and went to train with the Canadian Team again, thinking I would know how to do it better this time around. Despite my awareness and knowledge, however, I sustained another serious injury, which was likely related to OT behaviours, while training to make the team, this time a herniated disc in my lower spine. What I learned from this second attempt was that all the knowledge and insight I had with respect to OT did not stop me from getting drawn into the coercive dynamics of the competitive sport environment, in which I felt both explicit and implicit pressures from coaches and teammates to push myself harder than my body could sustain, to shut out the early signs of injuries and illnesses, and to keep silent about pain. Once again, I was left with the sense that there is a lot more going on at so many levels of human

experience in the context of OT that is not being tapped by the research. I wanted to know what drives athletes to overtraining. I suppose I wanted to understand what drove me.

CHAPTER 4: INTRODUCTION TO STUDY 1 AND STUDY 2 METHODS

Choosing an Approach

As stated in the introduction section, the approach I have chosen to write this thesis might be described as a mix of realist tales with confessional elements. In that regard, I have also been informed by a range of qualitative approaches in choosing the methods of the thesis, particularly in presenting the results of the two groups of interviews, those for experts and those for athletes. Although I began my approach to coding both the experts' and athletes' interviews with the aim of doing inductive content analyses, I found that I was going in two directions in accordance with differences in interview material from the two participant groups. Tight coding and thematic organisation of an inductive content analysis seemed to work well with the experts' interview data, which most often represented a report on experts' opinions or perspectives on OT, whereas thematic analyses seemed to detract from the richness of the athlete interview data, which most often represented detailed stories of the athletes' many experiences with OT. For the experts' interviews, Study 1, the choice to write a realist tale was best supported by the inductive content analysis, where data collection, analysis, display, and discussion rendered a product of coded and arranged themes and categories representing the interview materials. For the athletes' interviews, Study 2, I was drawn to writing narrative case studies, integrated with confessional tales, where my own voice as an athlete with overtraining experiences would feature in presenting the stories of the athletes. Furthermore, I did not want to lose the richness of the athletes' tales by trying to make them fit into any particular categories. With this divergence from thematic analysis, the athlete tales could be described as representing lived experiences, allowing the reader to identify with the athletes. Based on this difference in the approaches to handling the data for the experts compared to the athletes, I have presented the Methods sections for the two groups of

participants separately, written up as Study 1 and Study 2 Methods, at the beginnings of chapters 5 and 6, respectively.

Role of the Researcher

Sparkes (2002) stated, “some suggest that researchers-as-authors need to indicate their positioning in relation to the research process and the other people involved” (p. 17).

As an elite athlete myself, with a significant experience of OT, I have been intimately connected with the phenomenon under investigation. As mentioned in Chapter 3, I made two serious attempts to qualify for the Olympics in rowing and injured myself as a result of OT. These particular experiences have advantages for my research in that they give me first-hand insight into OT, which has helped in conceptualising the research and understanding the outcomes. My status as an elite rower has also helped me to gain credibility with, and access to, my research samples in both Study 1 and Study 2.

Nonetheless, my experiences also might have created some disadvantages. I have had to be cautious of biases that I may bring to the interview sessions. In particular, I have had to be aware that I was not leading the athletes or the experts to confirm my own experiences, rather I had to let them tell their own stories. I also have had to be careful to make efficient use of the interview time and not be drawn into telling the details of my own story.

Although my experiences create potential biases, I have attempted to take appropriate steps to reduce those biases. Such steps included extensive interview role-plays with my supervisors before beginning actual interviews with athletes or experts, continual supervision throughout the data collection phases to discuss the interview processes and outcomes, and continual self-monitoring of my own behaviour during the interviews, as well as during transcription.

Rigour/Trustworthiness

The following tactics for verification of findings (see Miles & Huberman, 1994) guided my approach to establishing rigour/trustworthiness in both Study 1 and Study 2: checking for representativeness, checking for researcher effects, triangulating, weighing the evidence, checking out rival explanations, and getting feedback from the informants.

In checking for representativeness, Miles and Huberman suggested that one constantly ask oneself about, and make adjustments to account for, common pitfalls and sources of error, such as sampling non-representative informants, generalising from non-representative events or activities, or drawing inferences from non-representative processes. In this thesis, my purpose was to describe the overtraining experiences of elite athletes; by sampling expert informants from elite sport organisations, discussing overtraining experiences of National and International level performers, and drawing conclusions based on these discussions, I hoped to cover the issue of representativeness.

In checking for researcher bias, Miles and Huberman advocated that one needs to examine the study for possible biases (stemming from researcher effects on the case, and effects of the case on the researcher), seek colleague feedback, and then generate and apply safeguards. As mentioned in the section on Role of the Researcher, I implemented interview role-plays, continual supervision, colleague feedback, and self-monitoring as safeguards to reduce researcher bias. These processes operated to reduce researcher bias primarily by challenging me to be aware of, account for, and at times step away from my own point of view on the research processes and outcomes. In the interview role-plays and supervision sessions, I was guided by a model of psychodynamic supervision, in which my supervisor constantly asked me to be aware of how my inquiries and interpretations were influenced by my own “stuff” and to maintain a focus on the interviewees as the key sources of data.

For colleague feedback, I presented my research methods and findings at multiple local and international workshops and conferences throughout my degree, during which I received multiple perspectives on my research, helping me to keep my views broad and to steer me away from biased approaches and interpretations.

For triangulation, the process of double-checking findings using multiple sources and modes of evidence, Miles and Huberman recommended displaying the different sources in a matrix for easy comparing and contrasting. Using the NVIVO qualitative data analysis software, I was able to display the data in tree diagrams, coding reports, and organised document outputs. I presented these displays to my supervisors and colleagues and used their inputs as sources of triangulation and double-checking.

In weighing the data, Miles and Huberman suggested being aware of the quality of the data by keeping a running log identifying stronger and weaker data, and by summarising one's views on the quality as one approaches the final write-up. I kept an ongoing journal of reflective thoughts throughout the analysis and writing processes to maintain a level of awareness for data quality.

In checking out rival explanations, Miles and Huberman advised involving someone else to play devil's advocate, focussing on discrepant information in order to generate alternative explanations, and checking out the merits of other reasonable explanations. The continual supervision process with my thesis committee members and colleagues, and multiple conference and workshop presentations of the ongoing research project, provided me with ample opportunity for critical review of the processes of data analysis and the resulting products. Throughout the writing of my PhD, I addressed several coaches, doctors, psychologists, and other experts at conferences who were more than willing to play devil's advocate with regard to my interpretations of my research findings; such challenges by others prompted me to consider, and in some cases accept, other

reasonable explanations. Furthermore, on several occasions I shared the verbatim quotes from athletes' stories with conference and workshop attendees, both experts and athletes; in these instances, the attendees corroborated the themes emerging from the athletes' tales with stories of their own.

With respect to getting feedback from the informants regarding the research findings, I spoke with, and received corroboration from, several participants in both the expert and athlete interview groups about the major themes emerging from, and my interpretations of, the research findings. Additionally, I had corroborating feedback from other informants in the sport world, who were not interviewed, regarding the major findings of the research. Working on placement as a training sport psychologist, I presented my findings in workshop format to several different groups of athletes and coaches. In many cases, athletes and coaches identified with the tales emerging from my research and supported the findings I summarised.

Standards for the Quality of Conclusions

In connection with rigour/trustworthiness and the tactics for verification of findings, Miles and Huberman (1994) suggested, "it's not enough to say that well-carried out tactics make for good conclusions" (p. 277). Miles and Huberman commented on the history of tension within the field of qualitative inquiry: interpretivist researchers often face a crisis of legitimation, where qualitative research is evaluated against the standards applied by the reductionist/positivist frameworks of quantitative inquiry. Commenting on this tension, Miles and Huberman explored some practical standards that can help judge the quality of conclusions from qualitative inquiry. Specifically, these authors discussed five, "somewhat overlapping" issues: objectivity/confirmability of qualitative work; reliability/dependability/auditability; internal validity/credibility/authenticity; external validity/transferability/fittingness; and utilization/application/action orientation.

Furthermore, the authors suggested some practical guidelines in the form of a series of questions related to each of these issues that can be applied to judging the standard of a qualitative study. In this section, I will discuss how I addressed these guidelines in relation to Study 1 and Study 2.

Objectivity/Confirmability

Miles and Huberman stated “the basic issue here can be framed as one of relative neutrality and reasonable freedom from unacknowledged researcher biases – at the minimum, explicitness about the inevitable biases that exist” (p. 278). Answering questions about objectivity (see Miles & Huberman, p. 278) in Studies 1 and 2, I have described my background and biases in both Chapter 3, my story of overtraining, and the section in this chapter on role of the researcher. With respect to the methods, I have provided a step-by-step breakdown of the procedures I took in each study, showing a clear “audit trail”. Finally, my conclusions for each chapter and my general conclusions were linked explicitly to the data, which was presented in summaries of the verbatim quotes in Chapter 5 and embedded in the athlete stories of Chapter 6.

Reliability/Dependability/Auditability

The issue identified here is whether the process of the study was “consistent, reasonably stable over time and across researchers and methods” (Miles & Huberman, p. 278). Answering questions about quality control (see Miles & Huberman, p. 278) in Studies 1 and 2, the findings showed “meaningful parallelism” across the different interview participants; coding checks were made throughout the analysis of the expert interviews, and there were several forms of peer and expert review, as discussed in the section on rigour/trustworthiness.

Internal Validity/Credibility/Authenticity

Miles and Huberman stated that this issue is about “truth value” of qualitative research findings, looking at whether the findings make sense, are credible, and present an authentic portrait of what is being studied (p. 278). Considering the truth value of Studies 1 and 2, the most significant validation has come from discussing, and receiving support for, the research findings with athletes, coaches, and experts, external to the studies, at workshops, conferences, in sport psychology practice, and at informal meetings. For example, numerous athletes have voiced massive identifications with the tales of overtraining portrayed in Chapter 6.

External Validity/Transferability/Fittingness

The issue outlined here is whether the findings are transferable to other contexts, how far they can be generalised (Miles & Huberman, p. 279). With respect to Studies 1 and 2, one could say that I might be restricted to applying the findings only to elite athletes, training at the national and international levels, as represented by the research sample; nonetheless, I have found myself in various discussions with people outside of elite sport who felt that the findings could apply to their lives as well. In particular, I have worked with persons in performing arts, both opera and ballet, who have found that the descriptions of overtraining, presented in my research, may apply to their domains as well. It seems that the processes and outcomes described in the conclusions are “generic enough to be applicable in other settings, even ones of a different nature” (Miles & Huberman, p. 279).

Utilization/Application/Action Orientation

Miles and Huberman commented that “pragmatic validity” or usefulness of the study for its participants, researchers, and its consumers might be considered in evaluating a study. Since the completion of my thesis, I have been involved and continue to be

involved in delivery of educational seminars and workshops that are a direct result of the outcomes of my research. Sport organisation, professional and amateur, as well as performing arts organisations have asked me to work with them in developing a greater understanding for overtraining risk and for possible intervention strategies. Furthermore, my thesis has been seriously considered as the basis for a publishable book, and book contract negotiations are underway.

CHAPTER 5: STUDY 1: EXPERTS' PERSPECTIVES ON OVERTRAINING

Study 1 Methods

Participants

I recruited 14 participants, including elite coaches and practicing sport medicine/psychology/physiology personnel, through national and state level sport organisations, and sports medicine clinics. When selecting participants, my main criterion was that they had experiences working with athletes at the elite level (National/International competition), who had had experiences OT. The sample comprised four national coaches, five sport psychologists, four sport doctors, and one sport physiologist. All participants (to be referred to as *experts* in this thesis) had significant experiences working with overtrained elite athletes. The sample size for this study was determined by saturation (when interviews with new participants no longer provided novel information).

Ethical Considerations

I informed the experts that participation was strictly voluntary, all information from the interviews was to remain anonymous; any personally identifying information they provided would only be available to the researchers. Where an organisation was involved, I made a separate ethics application to the organisation's ethical review board and I obtained written permission to conduct the research within the organisation.

Design

The data collection involved gathering information on the personal and situational variables related to OT, using an open-ended interview guide approach, as described by Patton (1990). The interview guide (see Appendix A for Expert interview guide) outlined the main topics I covered with each participant and kept the interview focussed on the OT topic, but the open-ended approach allowed me the flexibility to adopt a rapport-building,

conversational style. The interviews allowed the experts the opportunity to recall their experiences working with athletes who had overtrained. I followed up interview responses to initial open questions with probes for further expansion of relevant issues. All interviews were audio taped and transcribed verbatim.

Procedures

I selected the participants from experts working in a range of different sport settings, from private sports medicine facilities to state and national sport institutes. I obtained contact details and made direct calls to experts working in these settings, explained my research project, discussed the topic of OT briefly, and asked for voluntary participation in an interview about OT. If they expressed interest, I explained that the interview would be audio-taped, last approximately 1-1.5 hours, and would give them opportunities to recall their experiences working with athletes who had overtrained. I informed the experts the interview would focus on what they felt were the major risk factors of OT (see Appendix B for Expert Participant Information Letter). I told them that questions would cover topics, such as the characteristics of the overtrained athlete, training schedules, commitments outside sport, and the role of coaches, sports medicine personnel, and family in the OT experiences. All experts that I approached agreed to participate in the interviews, and I obtained written informed consent from each of them prior to conducting the interview (see Appendix C for Expert Participant Consent Form). At the end of each interview, I asked for referrals from the expert for Study 2 athlete participants, thanked him/her for participating in the interview, and informed him/her that the results of the research would be made available to them after completion of the thesis.

Analysis

The analysis and writing stages of this thesis comprised data reduction, data display, verification, and conclusion drawing, based on techniques Miles and Huberman

(1994) recommended, and employed successfully in previous qualitative sport psychology research (e.g., Gould et al., 1999; Gould, Eklund, & Jackson, 1993; Gould, Jackson, & Finch, 1993a, 1993b). I analysed all 14 transcribed interviews using the QSR NVIVO qualitative data analysis software. The components of data analysis are illustrated in Figure 1 (adapted from Miles and Huberman):

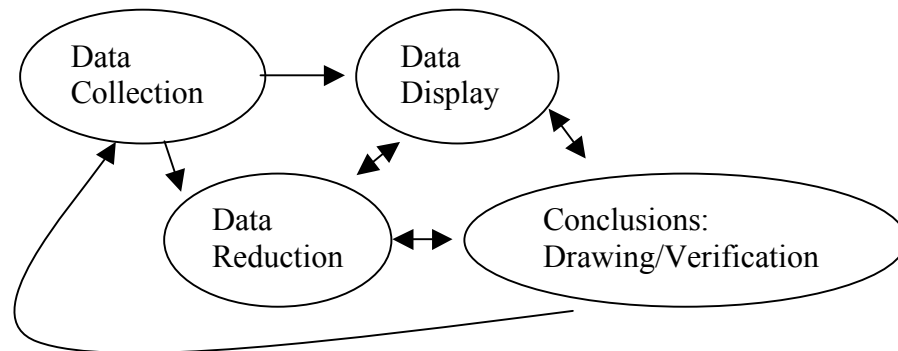


Figure 1. Components of Qualitative Data Analysis

In particular, data reduction, involved the processes of selecting, focusing, simplifying, abstracting, and transforming the data to produce the final presentation of the thematic content analysis. In data reduction, I carried out coding during which category labels were assigned to chunks of interview data with similar thematic content. I considered coding and recoding was completed when all of the incidents could be readily classified, the categories were saturated, and sufficient numbers of regularities emerged (Miles & Huberman, 1990). My data displays included hand-drawn matrices, charts, tables, and networks, which were designed to provide clear pictures of what was happening and to help me in drawing justified conclusions (Miles & Huberman, 1990). I made initial attempts to note patterns, explanations, and flows in the data, but aimed to maintain an air of scepticism until the data collection was over.

In the following paragraphs, I outline the specific steps I took throughout the progressive rounds of coding and analysis, and the processes I applied to reach the final output of the inductive content analysis.

First Round of Coding and Analysis

I went through each interview in its entirety, sentence-by-sentence, and selected data according to relevance to OT, the topic of investigation. For example, there were often conversational interactions, for rapport building, within each interview that were not related to the topic of investigation, which I cut out during this first round of data selection. This process represented initial data reduction, which resulted in large, albeit disorganised, chunks of data, deemed meaningful to the investigation of OT.

Second Round of Coding and Analysis

Following this first data reduction, I printed out my selected data and read through all of it again to get a feel for the material, making several further reductions by cutting out material that I may have included originally, but which, upon closer scrutiny, was not relevant to the OT context. Using the QSR NVIVO software package, I then initiated a round of free coding of the data, which comprised selecting specific, smaller chunks of data, or quotations, and labelling these specific chunks with headings representative of their content. For example, an expert might describe an athlete at risk for OT as one who will do extra training outside the prescribed training program; this datum would then be coded under a heading, such as “Does extra training.” If similar data from subsequent interviews appeared to communicate the same meaning, then they would also be coded under an already existing heading; for novel data, new headings were created. The free coding that I did was still part of the data identification and reduction processes, and resulted in further eliminations of irrelevant data. For many of the headings, I also recorded heading descriptions, in which I would note some of my thoughts about the

meanings of the particular data. I also kept an ongoing reflective journal, including comments on my thoughts about the data, the flow of my research, and what I saw emerging from the interviews. The free coding was recorded, and could be observed and displayed in the project node window of NVIVO. The free coding processes resulted in 609 passages being coded under 109 headings. Within the resulting 109 headings, some labels were quite specific, and some were more general.

Third Round of Coding and Analysis

The next step that I took was to follow the free coding with a more in-depth analysis and organisation of the passages from the 109 headings, with a goal to develop a tree-structure of major categories and subcategories, moving from the specific to the general. During this in-depth coding, new, more specific headings for data chunks were created, and some of the longer passages were broken down into smaller passages. This third round of coding resulted in 139 specific headings, coding 599 passages. Following the in-depth round of coding, I went through the 139 specific headings and corresponding passages, and identified themes/categories, emerging from the data, under which the headings could be organised. The 139 specific headings were then categorised into 16 general themes, and subsequently organised into three overarching categories, to form a tree structure. The data was displayed, and could be observed, as a tree diagram within NVIVO's project node window.

Fourth Round of Coding and Analysis

At this point, I took a step back from the data, having now developed an organised structure, and returned to the individual interviews. Attempting to be rigorous in my analysis, I asked myself the following: What was each participant really telling me here about OT processes? I went through each interview again, sentence-by-sentence, to get a sense of the major emergent OT themes. Some of the questions I asked as I went through

the interviews were the following: What is really going on here with these data? What sorts of questions are the data answering? What are the key factors emerging from the data? What other information is emerging from these interviews that is relevant to OT, even if it is not about risk factors? From this further analysis of the interviews, I created summaries of the emergent questions and answers. For example, a question that might be answered by the data was “What are the extrinsic, motivational factors that may lead an athlete to increase training to excessive levels?” I summarised the answers to such questions in my own words. I then compared these summaries to the previously inducted tree structure, and used the integration of the two to derive the final general dimensions. With respect to developing trustworthiness throughout the coding and analysis, I discussed my findings and perspectives with my supervisors, and we worked together to reach agreement about the final output of the analysis.

Final Construction of the OT Risk Factor Tree Diagram

After I had completed all the rounds of coding and analysis, I created a tree-diagram that would become the final representation of the inductive content analysis. My supervisors and I continued to refine the tree-diagram until we had reached agreement about the fit of the raw data themes under each subcategory, the subcategories under each major category, and the major category under each general dimension. Subsequently, following the development of the final tree diagram, I wrote the experts’ results chapter, presenting verbatim quotes from the experts to support the structure of the inductive content analysis. Once again, during this writing-up process, my supervisors and I discussed the choice of the most relevant quotations until agreement was reached about which ones to include. This entire process of coding, analysis, re-coding, in-depth analysis, stepping back, objectively reviewing the data, implementing triangulation processes with my supervisors, and integrating the final summaries, tree structure, and verbatim

quotations, made me feel confident that I was presenting an accurate picture of what was emerging from the experts' interviews.

Study 1 Results

The analysis of the expert interviews produced a picture of the personal and situational variables, which the experts proposed contribute to the risk for overtraining. Three general dimensions emerged, representing processes related to risk for OT. The three dimensions of OT risk factors were a) Characteristics, behaviours, and experiences of the susceptible athlete, b) Situations, factors, or people that pressure athletes to increase training, and c) Situations, factors, or people that affect athletes' needs for recovery. These three dimensions, along with the major categories, subcategories, and raw data themes, from which they were derived, are shown in Table 3, and are described in detail, along with supporting quotations, throughout this results section.

Table 3.

Personal and Situational Risk Factors for OT from Expert Interviews

Raw Data Themes	Subcategories	Major Categories	General Dimensions
Obsessive commitment to training	Obsessive-compulsive type characteristics	Athlete character or personality factors	Characteristics, behaviours, and experiences of the susceptible athlete
Never satisfied with performance or training	Extreme perfectionist characteristics		
Devastated if everything is not just right			
Extremely strong work ethic	Super-motivation; very high internal drive		
Very high internal drive for success/high ego-involvement			
No other foci outside of sport	Extremely high on athletic identity		
Fear of failure/combined with the need to prove oneself			
Derives all self-worth from sport			
May have significant underlying psychological issues	Existence of psychopathology		
Younger athletes going through growth and development	Increased OT risk related to age or developmental stage of the athlete		
Older athletes dealing with increased recovery needs			
Exposure to, and evidence of, infection or virus	Factors related to compromised immune system function		
Nutrient deficiency			
Very low body fat			

Table 3. (continued)

Has a history of physical or emotional abuse	Has experienced problematic health issues	Athlete experiences	Characteristics, behaviours, and experiences of the susceptible athlete	
Has a history of OT, health/illness issues, injury, and/or problems with sleep or other forms of recovery				
Has talent/potential at young age	Has experienced recent or previous successes or performance peaks			
Accustomed to success in most areas of life				
Experiencing a peak in performance				
Has been rewarded with success for pushing through pain or fatigue				
Has little experience with elite level training, and may rely heavily on others for guidance	Lacks experience and/or suitable guidance or support			
Lacks social and institutional support				
Athlete believes it is necessary to make up for any missed training or to get every single work out in without fail, regardless of the circumstances	Beliefs or attitudes that extra training is the route to success			Athlete beliefs, attitudes, and expectations
Believes in <i>more is better</i> approach or may express pride in doing extra				
Lacks awareness or knowledge of sport science concepts regarding training and recovery	Lacks knowledge or awareness regarding recovery processes			
Does not believe in recovery days and does not factor them into a training schedule				

Table 3. (continued)

Has unrealistic role models; compares self to others of different ability and even different physiology	Has unrealistic expectations	Athlete beliefs, attitudes, and expectations	Characteristics, behaviours, and experiences of the susceptible athlete
Has unrealistic goals regarding performance (may be evidenced with sudden increases in performance expectations)			
Trying to drop drastic amounts of weight to make limits for weight class sport	Risky behaviours surrounding eating, nutrition, and weight loss	Athlete behaviours	
Disordered eating behaviours – trying to lose weight to satisfy body image issues or to gain a perceived advantage			
Experiences guilt about missed or reduced training and responds with doing extra	Risky behaviours related to always doing more		
Will do more training than what is scheduled by the coach, and may not communicate about the extra training			
Does not take enough recovery or comes back too early from injury or illness			
Combining programs from multiple training sources to get the edge			
May be observed to do extra in most things outside of sport as well (e.g., work, school)			

Table 3. (continued)

Coach is inexperienced/overenthusiastic	Factors related to coaching experiences in sport	Behaviours, attitudes, and experiences of coaches	Situations, factors, or people that pressure athletes to increase training
Coach has experienced success with very high volume training or other risky practices, despite misinformed coaching practices or lack of knowledge			
Coach is highly acclaimed and has a large pool of athletes from which to select			
Coach is under financial/career pressures	External pressures on the coach		
Coach is under high pressure to make self look good (especially high profile coaches, professional coaches)			
Coach maintains a <i>win at all costs</i> attitude	Coaching style or focus		
Coach advocates very high volume training programs, based on <i>more is better</i> philosophy			
Coach has a short term focus on single performances or results			
Coach has an autocratic or non-communicative interpersonal style of coaching, especially problematic when combined with success			
Family and others reinforce <i>more is better</i> work ethic and other OT behaviours	Parents' and Others' Reinforcement Behaviours		
Family and others make approval contingent upon athlete's successes or do not provide praise at all			
Family and others that are very involved are totally success or achievement oriented			

Table 3. (continued)

Family and others pursue financial gain from child's athletic success	Parents & others seek financial or personal gain	Behaviours & attitudes of family and others	Situations, factors, or people that pressure athletes to increase training
Parents have been or still are athletes and might live vicariously through child			
Family and others derive personal satisfaction or self-esteem from child's performances			
Athlete may feel pressured to live up to expectations implicit in signing a professional contract	Pressures to gain financial reward or support	Specific sport factors	
Athlete may feel pressured to increase training or play injured to receive financial bonuses or prize money			
There may be pressure applied by government and sports institutes in suggesting that sport funding is totally contingent on athletes' successes			
Lead up to major competition	Timing or scheduling factors	Specific sport factors	
Team selection time			
Sports where there is an emphasis on low body fat or where weight limits are imposed	Demands of sport related to weight and age	Specific sport factors	
Sports with very young athletes competing at elite level			

Table 3. (continued)

Sports with <i>tough</i> cultures – histories of excessive training	Factors related to the sport/training environment or culture	Specific sport factors	Situations, factors, or people that pressure athletes to increase training
Large selection pool of high potential athletes			
Pressured team-sport environment with constant comparison to others			
Implicit demands of elite sport and having to learn one's own limits			
Moving up levels or increasing commitment	Transitional factors		
Coming back after a break or after injury/illness			
Coming to end of athletic career			
Cultures that reinforce or allow abusive dynamics between coaches and athletes	Reinforcement for attitudes and beliefs supporting OT	Socio-cultural and political factors	
Socio-cultural reinforcement for <i>more is better</i> attitudes			
Media reinforcements for performing injured			
National/cultural pride & reward pressures	Reward for pushing very hard in training		

Table 3. (continued)

Coach does not understand or acknowledge psychological &/or other stressors	Factors related to lack of knowledge, understanding, or awareness	Behaviours & attitudes of coaches	Situations, factors, or people that affect athletes' needs for recovery
Coach lacks leadership or initiative to alter training program or advise on recovery issues			
Coach lacks sport science knowledge or other knowledge about training and recovery issues			
Coach does not consider individual differences in physical or psychological resources and capabilities			
Coach reinforces silence regarding or does not communicate about injury, illness or fatigue issues	Factors related to health issues		
Coach pushes for early return from illness or injury			
Coach endorses, supports, or does not intervene in, athlete's drastic weight loss behaviours			
Family and others ignore or deny consequences of setbacks, such as injury or illness	Attitudes toward life balance and recovery	Behaviours & attitudes of family and others around athlete	
Family and others assume athlete is balanced – or ignore life balance issues			

Table 3. (continued)

Family and others are anxious about athlete's time off	Factors related to health issues	Behaviours & attitudes of family and others around athlete	Situations, factors, or people that affect athletes' needs for recovery
Family and others push for early return from injury/illness			
Training program lacks variety or is overly repetitive	Training program factors	Specific sport factors	
When there are many non-coordinated inputs regarding the athlete's training needs and schedule			
Non-individualised training program			
Training program that emphasises one area of training, to the exclusion of other important areas			
Multi-discipline sports training program that does not take into account recovery requirements of different disciplines			
Training designed to maintain constant peaking in performance			
Athlete has to work, in addition to training, to afford training and competition expenses	Pressures from financial strain or lack of resources	Specific sport factors	
Athlete misses out on sport science resources because of a lack of funding			
Lack of significant seasonal layoffs	Other sport-related factors	Specific sport factors	
High frequency of competitions			
Sports with typically very high volume training			

Table 3. (continued)

Leaving home/changing environments, going to a bigger team	Transitional factors	Specific sport factors	Situations, factors, or people that affect athletes' needs for recovery
Travel/time zone changes			
Changes in physical environment - weather, season, altitude			
Stepping up training volume/intensity			
Going into a taper			
School, university, study commitments	Activities demanding time and/or emotional resources	Other life factors that interfere with recovery	
Demands of being in or having a family			
Work commitments			
Publicity/media commitments			

General Dimension 1: Characteristics, Behaviours, and Experiences of Susceptible Athletes

Looking at the types of athletes who are susceptible to overtraining, experts offered several opinions that related to General Dimension 1, the character or personality traits, past experiences, and observable behaviours that might contribute to overtraining and its outcomes. I imagine any athlete could fit into many of the categories depicted in Table 3, and could be described by several of the raw data themes classifying athletes at risk for OT; nonetheless, experts seemed to emphasise that athletes at risk are likely to be at the extremes of the character, experiential, and behavioural factors. General Dimension 1 comprises five major categories, which are (a) Athlete character or personality factors, (b) Athlete physical susceptibilities, (c) Athlete experiences, (d) Athlete beliefs, attitudes, and expectations, and (e) Athlete behaviours. Some experts were careful to point out that athletes will overtrain for a variety of different reasons, and one must be cautious in describing trait-like characteristics related to OT risk. Nonetheless, there appear to be certain characteristics, histories of experiences, and patterns of behaviours, for athletes, which, when identified, might support coaches and others in optimally managing athletes' training and recoveries, and, conceivably, reducing the risk of OT. The major categories of General Dimension 1 are addressed in the following sections.

Athlete Character or Personality Factors Contributing to Overtraining Risk

This major category includes descriptions of trait-like characteristics that might be observed in athletes who are at risk for OT. Although, experts pointed out that there is no specific profile of the OT athlete, they acknowledged that some character or personality traits might be associated with higher risk for OT. Within this major category, there were five subcategories, comprised of the following: a) Obsessive-compulsive characteristics, b) Extreme perfectionist characteristics, c) Super-motivation or extremely high internal drive,

d) Extremely high athletic identity, and e) Existence of psychopathology.

Obsessive-compulsive characteristics. Several experts reported that athletes at risk might exhibit obsessive personality characteristics. These athletes might be observed to be obsessed with gaining every little advantage from training, nutrition, or any other aspect of their lives, all the time, usually at the expense of living balanced lives and getting adequate recovery.

It's sort of like they're getting into an obsession and it's not just with their physical training but where their sport seems to be taking up more of their time than it usually does, even though technically they are in good form for whatever time of the year they're at.

Compulsive. It goes right along with compulsive behaviours, people who are really just compulsive and very meticulous about the things that they do. I think it tends towards that and compulsive definitely more than meticulous, because meticulous people can, if they are well instructed, can be quite safe.

Almost a compulsion to train hard and I guess based on the assumption that the harder I train the better I'll perform. When in fact the harder he trained the worse he performed. He got past the point of no return I think.

Extreme perfectionist characteristics. Although it was noted that most athletes might be classified as perfectionists to some extent, experts reported that the athletes at risk for OT are likely to be on the extreme end of perfectionism, where they may never be satisfied with success, always demanding perfection. Such athletes may always compare themselves to the highest standard, even when the standard is unrealistic for their current levels of achievement.

I tried to help him through that, but it was almost impossible for that athlete, because of this fairly inflexible attitude towards doing it right... it's certainly bordering on perfectionism.

At their peak they could never fully take responsibility for their performance. It was almost as though, "Well, it still wasn't good enough. It wasn't perfect. I need to strive harder." Of course, in striving harder then they tip over the edge and fall into a deep trough.

One is the perfectionist . . . any kind of perfectionist characteristics, where the person that absolutely wants to get every single thing right and, often times, actually goes on the side of getting everything right plus a couple of extra percent.

So, certainly, the person who is very intent on doing everything right, doing every thing they possibly can in order to achieve.

It's afraid of not keeping up, afraid of not making top marks, afraid of not being able to go on. Creates this perfectionist kind of, this compulsive perfectionism that drives people to do extra work, extra work, extra work, drives them to extremes.

Super-motivation or extremely high internal drive. Although being driven or motivated would appear to be important factors in successful athletic performance, such characteristics, especially when manifested as extremes of behaviour, might also put athletes at risk for OT. Experts commented that some athletes at risk could be characterised by super-motivation or extremely high levels of internal drive. Athletes with such high levels of motivation or drive might tend to make decisions about training and recovery that increase the risk for OT.

There are people out there that are highly internally motivated, that have a huge need to achieve on a personal level and it has nothing to do with gold medals and has nothing to do with records and it has nothing to do with making teams. It is all about me testing myself out every single day. "Am I doing better today and tomorrow?" So, high drive for internal success, prime candidates for overtraining.

You know people who are driven, you know really driven to be the best, for whatever reason, and, often times, there's a tremendous amount of ego involvement in that. It's very rare that you hear that person really expressing the artistry of the activity or anything else. They are driven purely on achievement. . . . Be the best because it's a marker. . . . It's the stuff you would consider on the ego side as opposed to mastery kinds of orientations.

The decisions about training and recovery, prompted by super-motivation, might be manifested in an athlete's work ethic. Intuitively, work ethic seems to be a positive characteristic, important for successful training and performance. Experts noted, however, that being aware of athletes with extremely strong work ethic might help identify the athlete at risk, especially since coaches might reinforce the extremes of work ethic.

I'd be looking at the other side of the work ethic and see how strong that is. And I don't know whether anybody has ever really researched work ethic, but it is a thing that comes up in coaching a lot; they look for the people with great work ethic.

Extremely high athletic identity. Experts commented that the athletes at risk often have extremely high athletic identities, seeing themselves as nothing but athletes and not having any other things to focus on besides sport. Such athletes might not have alternatives, besides their sports, to give them a sense of accomplishment, or to give them a sense of security in the event that their athletic career is cut short.

A lot of athletes see themselves as athletes and nothing else and they left school under difficult circumstances, either not having completed school, having left early, having been kicked out of school, whose life then, was very much dependent upon proving themselves to be of some worth and obviously not choosing school to do that through.

I guess from a personal perspective, I don't know whether it's a personal or situational, but what options are tied up in this athletic identity business - Do they have alternative career paths? I mean is their sport the only thing that they've got in their life? If it is, then you would predict that they're going to push harder and harder and harder, because they can't afford to fail this or they've got nothing else to turn to.

These athletes with extremely high athletic identities might have such strong needs to prove themselves in sport that they will do anything to appease their fears of failure.

Now I think all of it is probably wrapped around this need to prove themselves. So they're constantly proving it, I think it's a terrible way to live. It's a pressure that they really shouldn't have to be carrying around on their shoulders all the time.

They are afraid of failure. All of their identity is caught up in their sport as they get older -there are less things in your life because you have sacrificed so much.

I think a lot of people who are overtrained probably experience those kinds of thoughts and beliefs that they constantly have to prove themselves.

Furthermore, athletes with very high athletic identities might also derive most of their sense of self-worth from sport achievement, and, thus, they are driven to push excessively when things do not go well, or when they see their goals slipping away from them. These athletes might believe that good sport performance equals good person.

Everybody's identity gets tied with something and with athletes their identity is their sport. Some people have a really robust identity, they're a boyfriend, they're an artist, they're an architect and they're an athlete, but some people just have a very narrow identity and this is everything to them and for some elite athletes. . . "I want to be known as a great person. I want to be proud of who I am. I have chosen

to be an athlete. . . and I want to be the very, very best that I can possibly be. Every time somebody beats me that means that I am not that great. Every time I win that means I'm great." So, in their greatness, their sense of identity starts to fail. They just do not want to give up on being somebody that's worth being liked or worth being loved or worth being great.

Someone who has no self worth . . . who's also very, very motivated and driven to achieve . . . but from a position of "This will save me. This will mean I'm of some value." Of course, it never means that at all, because once you've got your gold medal, then you have to figure out what's the next thing, because "I still don't feel like I'm of value now. I've got to find something else to go and do, what am I going to do then."

Existence of psychopathology. Although mentioned only once or twice, a couple of experts pointed out that, in some athletes, there might be evidence of underlying psychopathology that could be part of the OT behaviours. The rates of occurrence of psychiatric problems in competitive sport are not well established (Brewer & Petrie, 2002), but athletes with diagnosable disorders could conceivably use excessive training to cope with their inner conflicts.

Researchers are always seeking out these really over-trained people, but a lot of them turn out to have some other problem. . . . They might turn out to have some sort of psychiatric disorder, or something like that, on occasion, which explains their behaviour. . . . Certainly, I think . . . in any field there are people who are borderline manic depressives, if not full-on ones, and it is just a matter of recognising those phases.

Summary of character or personality factors. With respect to character and personality factors, experts emphasised that there is no single profile of the overtrainer. Athletes might overtrain for a number of reasons, some of which might be attributed to personal characteristics. Nonetheless, manifestations of the extremes of a few athlete characteristics, such as athletic identity, motivation, perfectionist tendencies, or potential psychopathology, might alert coaches and others to OT susceptible athletes.

Athlete Physical Susceptibilities

This major category includes descriptions of issues related to Athletes' physiological health that are associated with increased risk for OT. Experts commented

that it is important to assess physical weaknesses in athletes when determining level of risk for OT. Within this major category, there were two subcategories, comprised of the following: a) Factors related to age or developmental stage of the athlete, and b) Factors related to compromised immune system function.

Factors related to age or developmental stage of the athlete. Many experts reported a number of age-related physical characteristics that contribute to the risk for OT. It was noted that the age of the athletes is important to their physical capabilities, for different reasons, dependent on whether they are younger or older. For adolescent and younger athletes, underdeveloped skeletal and muscular structure, and other physiological changes that occur through adolescence and puberty, can impose limits on the amount and type of training that these athletes endure.

You've got somebody who presents with stress fractures in the back that could be, perhaps, an overtraining type injury, but, on the other hand, maybe they're not aware that they are . . . at that particular time in their life when the facet joints, or the actual bones, haven't fused in the spine together properly so that they are more likely to end up getting a stress fracture.

For example, there's been a study about young cricketers, bowlers . . . and something like 80% have had some sort of stress reaction in their spines, particularly ones who have got a mixed bowling action. So, you've got a situation where they are putting forces through their bodies, which the bodies are not really ready for.

You might see people who start to do weight lifting . . . younger and younger kids. And, there is nothing wrong with doing some sort of weight lifting, but, for example, you really wouldn't want to do full squats or dead lifts when . . . your spines are still not fully mature.

The important thing, for example, for coaches and parents to understand is that, as kids go through puberty, their bio-mechanics totally change. . . . If you grew 6 inches in 3 months . . . your bones . . . grow fast, but your muscles and your tendons take about 18 months, and your neural structures take about 18 months to catch up to the growth of your bones. . . . After stretching your muscles out . . . you've got a total change in the bio-mechanics because the strength of the muscles at the lever basically changes totally. . . . It's at that time that young people are often said to be lazy, stupid, indifferent. "Pull your finger out." "Get with it." And the coaches get frustrated. The parents get frustrated. The kids often get so frustrated that they give up their sport because people are not accepting or recognising that this is a time when you have got to actually pull back and you

don't try to raise the bar. In fact, don't raise the bar. In fact, even lower the bar and keep them going until they go over that period.

The younger girls, they're still going through their metabolic changes, their menstrual cycle changes. It's hard for them to control their weight at that age; all these hormones keep changing.

Experts suggest that not paying attention to these physical limitations, and loading up young athletes with excessive training and dangerous practices can put these athletes at serious risk for overtraining and injury. For the older athletes, decreases in physical potential, especially with respect to increased recovery needs, can put these athletes at risk for overtraining as they fight to maintain training loads and intensities that they sustained at younger ages.

People who are elite athletes, as you get older you're more susceptible to injury just through age and fatigue and you can't do what you used to do. I found with older elite athletes who don't learn will keep getting injured and life gets very difficult. That is because they want to keep on pushing and they do not know anything else.

Male mid-30s . . . quite fit for their sport, quite good for the sport, elite in their sport, but always tired, always overtraining. Has not had a history of too many injuries, but just keeps thinking they can do things that they used to do, and harder, without resting, and they get injured and pissed off.

You can't push the senior athletes like you can an age group swimmer because they don't regenerate as quickly and I think that some coaches that deal with age groupers have a problem dealing with senior athletes because they think they can treat them the same.

Factors related to compromised immune system function. Experts commented that risk for OT might be compounded by lowered immunity. On the one hand, when athletes train excessively, their immune systems may be taxed to the point that they are more susceptible to illness; on the other hand, picking up a minor infection or virus can add to the physiological stressors for which an athlete needs recovery, and, thus, lead to a state of OT, especially if the athlete tries to train through the illness. In looking at physiological risk factors, experts noted that there may be evidence of compromised immune system, manifested in constant infections, viruses, and sometimes related to very low levels of

body fat.

I've had the case of the swimmer who really did get to the point where his skin fold measures were extremely low, you know sub 40 mm over 8 sites which is very low skin fold by anybody's standards, who trained very, very hard . . . had a very professional attitude towards anything to do with his sport, and just worked very hard and kept getting ill to the extent that he just couldn't continue. . . . His skin folds got so low that his immune system was compromised and he kept getting this recurring illness thing.

I think that there is more and more evidence today about the importance of the neuro-hormonal effect on the body, and that a lot of diseases that we have are neuro-hormonally influenced. So, if you are under a lot of stress, you are much more likely, if your immune system is down, you are much more likely to catch that bug, if you catch that bug, you are much less likely to respond to it well.

Well in some cases perhaps it's exacerbated by the training, but in some cases also disguised by the training . . . because of the level of fitness, just the motivation of the athlete, that sort of thing. They were training in the face of significant illness.

I mean there's a classic one in that regard, the athlete who does become iron deficient and is really anaemic and they train harder; they find they don't perform. I've been in the situation myself. You think you are training well or getting enough rest and people who normally you beat are running away from you. So then you think well I've got to get a bit more rest and train a little bit harder and you get worse and so you start to think "Well, gee maybe there's something actually wrong with me," and then that shows up.

Summary of athlete physical susceptibilities. It appears that there are a number of important factors to consider when assessing physical/developmental issues contributing to OT risk. On the one hand, coaches, athletes, and others might pay special attention to the developing musculoskeletal systems of adolescent and younger athletes, which, when going through changes and growth, may be particularly vulnerable to injury from heavy training loads. On the other hand, coaches, athletes, and others, might be aware of the diminishing physiological capacities of mature athletes, especially with respect to decreases in recovery capacity. Irrespective of age, it appears important to monitor athletes' immune functions and to check for minor illnesses or infections, which could lead to poor recovery, and, eventually, to OT.

Athlete Experiences Contributing to Overtraining Risk

This major category includes descriptions of the types of athlete experiences that might increase risk for OT. Experts noted that particular experiences in athletes' careers can lead them to maladaptive thinking processes and response patterns regarding OT, injury, and illness. Within this major category, there were three subcategories, comprised of the following: a) Has experienced problematic health issues, b) Has experienced recent or previous successes or performance peaks, and c) Lacks experience and/or adequate guidance or support.

Has experienced problematic health issues. Experts pointed out that having a history of OT, illness, or injury might predispose athletes to risk for OT. Athletes with such histories might have received reinforcement for their maladaptive responses to injury in the past, or, they might not have been aware of the significant influences of the injury, illness, or OT in their training and recovery processes.

I've seen the whole range I guess of athletes at the worst extreme, athletes who were over-trained to an extent that they've become ill in a recurring way and it's ended their career and I can think particularly of one swimmer who got to that stage where he was unable to continue swimming at all, made attempts at come backs got ill again and basically ended up out of the sport. I can think of a couple of athletes to whom that has happened.

There's another group of athletes who have been susceptible to overtraining and injury, and I can think of 5 or 6 world champion athletes that I have worked with . . . in a range of different sports, who have exhibited the same cycle of swings . . . which is, at the low of the trough, to be either injured or ill from overtraining. . . . This group all exhibited the same pattern of cycling depression, illness, injury, followed by bouts of exceptional performances across their careers. It was mystery to them as to why this kept happening and quite frustrating to them as to why the pendulum never sort of found a middle road, balance point. . . . In the general sense of overtraining they would overtrain and drop into this deep trough and then they'd wallow around there until it frustrated the hell out of them and then they'd somehow claw their way back out. . . . But, in between times, they were a disaster and they would wreck coaches, they would wreck themselves; their lives were miserable and they spent times ill or injured, again because of this overtraining syndrome.

You've also got, obviously, injuries caused by what you would consider to be overtraining, pushing too hard. . . . You've got to look at any physically abnormal

events, and that may be an injury type thing, which is chronic. . . . Their bodies and minds are in such a routine they do not identify [overtraining] as dangerous. Even after the injury, they probably don't.

I have one triathlete, who is actually an orthopaedic surgeon, and she is on her 11th stress fracture, being operated on for a stress fracture of the navicular. That was just up at the hospital and she didn't want to park her car in the hospital. The sensible thing would have been to get a taxi to the hospital or something, or get a lift, but, no, she ran to the hospital in the morning . . . with a stress fracture and she arrived about a half hour before the operation and had her stress fracture operated on.

I've seen difficulty with athletes that are injured whether its injured because of over-doing it, or not, there's a big problem of trying to hold elite athletes back and telling them you have to wait, you have to wait, you have to wait.

In addition to OT, illness, and injury experiences, some experts suggested that athletes, with past histories of physical or emotional abuse, might be more likely to push excessively in training. For athlete victims of abuse, in some instances, they may feel compelled to please the coach by training harder and harder without complaints. In other cases, they may not communicate about feelings of fatigue, illness, or injury because they are afraid to confront the coach or other authority figures.

I think if you look at . . . the number of kids who have been abused in our society, one way or another, physically, emotionally, sexually, whatever, and you look at all these [athletes], some of them will have been abused. You'll never find out about it and that abuse might be the thing that drives them more than anything else.

I've had many clients, who are athletes, have been athletes, who have experienced severe abuse through their growing up. They then come into a sporting situation where we really have a socio-cultural environment that, in many aspects, replicates the dynamics of abuse. You have a very hierarchal system where enormous power is invested in coaches and they are really, often times, only accountable for their athletes' performances. . . . You have a very powerful person, who cannot be challenged. Because you are an elite athlete you are seen as something very different and it is very isolating in itself. Other people don't interfere with those kinds of coaching behaviours because it's elite sport and it's so special and different.

We, in sport, have normalised, I feel, an emotionally abusive environment and we have just accepted it. . . . So to me all of these [overtraining] issues are what's going on with how people organise themselves around coping with being in an abusive situation. If you're an athlete and you're in a sport and the coach is this powerful person and you are away from your family, then that coach becomes the primary role model, the primary attachment figure in your life. . . . To maintain attachment, you will seek approval. Young people will seek approval of the

primary attachment figure and in sport approval will be there for going the extra mile. Now if the primary attachment figure is emotionally volatile or arbitrarily gives out reward and punishment, then you are going to have . . . a very disorganised attachment. . . . So, why are we surprised when this athlete is trying to do everything perfectly and just over stretching every single way so that they can have some emotional safety while they are around their coach?

Some have the need-to-please-disease. They just absolutely want the coach to love them and appreciate them so much that they'll kill themselves. Maybe it was with their dad, or something like that; maybe they never felt like their dad loved them. Now they've got this coach and the coach only gives them only a little morsel of respect and praise if they win a race. We've seen so many incredibly abusive relationships with female [athletes] and there was a real noticeable one in Australia where the woman has been physically, she's been hit, "You stupid bitch. Do you know how much money you cost us by not winning that race?" and really violent stuff.

Has experienced recent successes or performance peaks and/or displays potential at an early stage. Although successful performance is a primary goal in sport, and athletes are applauded for their physical talents, it seems that how athletes react to their successes, or how they are motivated by their potential, can have a significant influence on their training and recovery processes. Experts noted that successful performances, or times of physiological peaking, can put athletes at greater risk for OT. Experts reported that athletes who had success, or showed potential, at very early ages might have developed very high expectations of future performance, which could motivate them to train excessively.

He's got this young kid who's a cyclist who he thinks is, well we've sort of been lead to believe is fantastic, potential cyclist (and he is not much at all) and developed all these over-training symptoms.

Athlete, who is extremely talented in her sport, gets picked up into the elite training program and so comes with this expectation of what sport has been like back in her little home town. . . . So she gets to the elite program, which is at this point run by an extremely emotionally abusive coach . . . and ends up with eating disorder problems, overtraining problems and is in extreme distress.

Experts also pointed out how athletes in peak form are motivated by feelings of personal achievement to push even harder in training, hoping to reach even higher levels of performance. Unfortunately, this extra bit of pushing might tip athletes over the edge to

OT, especially since, with their current peaks in form, they are likely to be precariously close to OT already.

I was thinking, “If he can be in this good form now, imagine what he can be like with a couple of extra laps or a couple extra of these.”

She was just busting out of her skin. She was laying down power outputs. We had to calibrate and recalibrate . . . because we could not believe it. She was just on outstanding form. Even with all the knowledge we had, we had a very, very difficult time trying to contain her because she was just in this superman mentality. I reckon that when she hit the race, she was coming off of feeling great because she had abused herself for two weeks showing us how wonderful her form was. At the time trial, which was a couple days later, she had the most disappointing results you can imagine, probably one of her worst results ever at international competition, and it was at the Olympics. She probably had a chance to medal or at least go top five. If we could have had her two weeks earlier for that time trial, she would have ripped it apart. . . . You never know how much to back it off. It is so much fun to see it. As coaching staff, you are all marvelling at it.

There was a male who was a national time trial champion. He was at an altitude camp in the best form we have ever seen over a four-year block. He had some of the best form leading into the world championships, in Columbia at altitude, and up at Vail, Colorado, he was just brilliant. He was launching into a new level and he could not believe how good it was for him. . . . he is now a professional. We saw him in some of the best form of his life. He was just ripping it up. Everyone was just going, “You were just unbelievable!” He was just loving life. Everything was going so well for him. Then, after that camp, he went over to Europe and he was in the biggest fatigue hole for three weeks.

I think what happens is, as the form starts to go, you see this real elusive goal slipping through your fingers. It is not gone so you can’t say I have lost it. It is just slowly being lost, so you think, “I will just try a little harder. It is not that far away.” You never say “Back off. It is going. Let it go and it will come back.” Instead, you keep chasing it to death and that is when you run into the hole.

For some athletes, a one-off, peak performance could predispose them to OT because they are overly motivated by the result and set their expectations unreasonably high.

For one reason or another they have a very successful performance, which clearly was one of those exceptions where there’s a conjunction of everything. Everything goes right on the day and they perform well; the weather is good and everyone else performs badly and all of a sudden they produce the performance of their lifetime and then they expect to replicate it ever after. Obviously if you can, if you’ve done it once you should be able to do it again, but that can’t always happen, and people live on that expectation, and all of a sudden they’ve raised the bar for themselves just that bit too high and they’ve got to re-set a little bit.”

One expert also pointed out that the characteristics and behaviours of the athlete that help to get them to success in their sports, such as perseverance in the face of pain and fatigue, are also the characteristics that put them at risk for OT.

So it's the natural reaction of the striving, achieving person to try and make something happen when it is not working. I mean that is part of what makes, especially if we are going to talk about elite athletes, that's part of what makes elite athletes elite. They don't let go. They actually go out there and say, "I am going to work through this." You work through pain, you work through discomfort, you work through fatigue, you work through crappy conditions, you work through all kinds of stuff in order to achieve what you want to achieve. So, when it comes to your body breaking down, well, just work through it, and it kind of makes sense. So, we definitely have to recognise if we're talking about elite athletes we're talking about people who predispose themselves to getting in trouble when they're rehabbing, and then if you take somebody whose a real driven person, then we have particular problems.

Lacks experience and/or adequate guidance or support. Social, educational, and emotional support can be important factors for helping athletes balance their training and recovery needs. Others, who should play supportive roles, however, sometimes provide poor guidance with respect to training and recovery. On the one hand, experts commented that athletes, without developed experiences or knowledge regarding their training and recovery needs, may be at risk for OT, if they are overly reliant on coaches or parents for guidance, particularly where the coaches or parents promote OT behaviours. On the other hand, experts noted that athletes, who do not have adequate support because they train on their own or are outside of a supportive environment, may also be at risk for OT.

When you are looking at someone who is underage, I suppose it is harder for that individual to say no to the coach or to the parent. . . . When you are dealing with junior athletes as opposed to more mature athletes, you are looking at different reasons for overtraining.

You haven't got a father who is a physio or a doctor, or whatever, who can actually advise you about the potential dangers of what you are doing, then you just keep doing it and then all of a sudden, you know your leg breaks in half or, due to a stress fracture we've seen sometime ago, you collapse.

Some of them might be isolated from their family, and not have a good social support structure, and not have good relationships that are supportive.

He is a bit more isolated from support and his sport is the only thing, he is more likely to retain those gung ho, early '20s sort of attitudes that will make him susceptible to injury

Summary of athlete experiences. Any time an athlete initiates a training program, begins a training cycle, or starts up with a new coach, it may be important to gather information on their experiences in sport, especially related to problematic health issues, overzealous responses to success, and access to helpful support networks. Experts pointed out some experiences that contribute to the risk of OT, such as history of OT, illness, or injury, which seem obvious; nonetheless, they also emphasised other factors, such as past successes, or experiences of peak performance, that one might not postulate, intuitively.

Athlete Beliefs, Attitudes, and Expectations

This major category includes descriptions of athletes' beliefs, attitudes, and expectations, which might contribute to the risk for OT. Experts pointed out that the cognitive processes of the athletes, what they think and understand about training and recovery behaviours, can have a significant impact on how the athletes make decisions about OT. Within this Major Category, there were three subcategories, comprised of the following: a) Has beliefs or attitudes that extra training is the route to success, b) Lacks knowledge or awareness regarding recovery processes, and c) Has unrealistic expectations.

Has beliefs or attitudes that extra training is the route to success. The ways athletes respond to fatigue, injury, changes in performance, and other training and recovery issues will be influenced, in part, by their beliefs and attitudes. Experts remarked that athletes at risk for OT may hold beliefs that they cannot miss training, regardless of the circumstances, and that they have to make up for any training sessions if they cannot help missing them.

His thing is if he doesn't do the quantity of training, then he is losing out; he has to make up for it. Forget the quality of the time he is actually there. Because he is so unrealistic he has looked at quantity rather than quality.

They might get out at 11 o'clock at night and do that one hour training run to make sure that their volume is high through the week. Some of that behaviour has allowed them to become great, but that same behaviour can go over the top and be the source of their downfall. That's the funny thing the very trait that makes you great, can be the trait that destroys you in so many areas of life.

A lot of athletes make that mistake, "Didn't train today because I was too tired, I've got to make it up now and do extra tomorrow."

In accordance with having to make up for missed sessions, athletes may firmly believe that more training is always better than less. Most experts pointed out that the more is better attitude is pervasive among athletes susceptible to OT.

A compulsion to train hard . . . based on the assumption that "The harder I train, the better I'll perform." When, in fact, the harder he trained, the worse he performed.

There's just this idea that "The more I put on, the more I can do, the more that I could possibly tolerate." This is the overall psychology of it, "The more I can tolerate, the better I'll become."

Elite athletes do know for sure that working harder gets them better. If there's a question mark, a question mark on the side of that belief, we're going to move on the side of that belief, of working harder, rather than on the resting side.

This more is better attitude often may be in contradiction to more moderate approaches advocated by coaches and others, where athletes may be encouraged to do less training or to take more recovery. Experts commented that some athletes will continue to hold onto and act upon these beliefs despite guidance to the contrary.

As soon as he stepped out of my office and went back to the environment of the pool he was back where he left off, which was "I need to train harder. I need to work hard if I'm going to be the best in the world at what I am. I need to work harder than everybody else."

"I need to train harder. I need to work harder. I need to try harder. I need to cover all the bases." I think when the crunch comes that's what happens. In moments of more rational, objective, controlled thinking, I am sure they'll agree with the principle, but when the crunch comes, I think they are always going to revert back to the need to perform and the need to work harder.

What has been said [to the athletes]: "If you're not recovering, you're not adapting to the training." But, maybe . . . an athlete thinks more is better . . . "Yeah, I'll just go out and do more. It won't matter."

I am not a coach who is going to push his athletes. . . . More often than not at the level I get to it's actually the athletes who are predisposed to overtraining. It's in this more is better psyche.

Lacks knowledge or awareness regarding recovery processes. Many elite athletes may have had some education on sport science principles of training and recovery processes; lacking awareness for, and knowledge of, the proper application of such principles, however, can put athletes at risk for OT. Experts commented that athletes at risk for OT might not realise the importance of recovery, or understand such concepts as de-training and periodisation, or the applications of nutritional knowledge in the training context.

The first question I'd ask somebody is, "Do you think a day off the bike is not a good thing for you?" Can you tell me, "What is your understanding of de-training?" This is an issue that's relating to de-training. How quickly does an athlete de-train. . . it's so individual and that's where the individuals need to learn their bodies.

When I see these signs, more is not better. Athletes may not know it, but you can learn that stuff. It takes time to learn it, but it takes good coaching and good education, like teaching you how to put it into practice, which means understanding fatigue. What is the level of fatigue? Are you talking about just being tired and then 10 minutes later you feel OK or tired and 20 minutes later your heart rate is still up.

If you just ask people what is their typical training schedule and they say, "I train every day. . . . I just run fast or just ride hard" You can see that there is no sense of balance, no hard-easy balance. Hard-easy is a really basic principle. If you don't see those kinds of things - you don't see training cycles where they build up with a heavy load and then you come off it for a while - you know that there could be problems. . . . Injuries and overtraining come from doing the same things over and over again. This is where you see problems coming up, not following some of the basic principles of sport science.

Without awareness for the importance of recovery, athletes at risk might not believe in taking recovery days. Experts commented that athletes at risk might have skewed perceptions about the meanings of recovery, or they might simply see rest days as counterproductive.

She'd almost be over the top saying, "I'm taking all these breaks. I'm giving myself plenty of recovery. I mean how much more can I do. I mean for God's sake, I'm only training two to three hours a day now." You're thinking, "Two to three

hours, it's still pretty high." You could tell her, "You could probably take off a whole week doing nothing," and she would say, "That's getting a bit extreme. We wouldn't have to go there." and you're saying, "It's getting pretty extreme. You haven't had good form for over two months!"

One of the big discussions that comes up, and this is part of this education, is that, for most athletes that are susceptible to overtraining . . . the problem is that they see recovery days as non-productive days. The big push now is for athletes to understand that your gains in strength are made on recovery days. So your work days are actually break down days. When you actually run, you push yourself to overload, you're breaking your body down and it is your recovery days that actually make your body stronger.

Another good question to ask is if they see a rest day as a training day, as part of their program. People who are susceptible to overtraining see a rest day as a bad thing. Mature athletes see it as a training day, as part of their program to take rest.

People do not think about all the ways to modify their training to get good recovery, and overtraining athletes never do that.

Has unrealistic expectations. Athletes may be seen to be people striving to reach lofty goals of performance; many elite athletes have aspirations to be Olympians or world champions; nevertheless, when athletes set performance goals that are far beyond their current levels of achievement, they may risk OT behaviours as they pursue something that is unrealistic. Some athletes might have had some isolated experiences of success or other influences that might lead them to expect more of their performances than what is reasonable for their current fitness and skill levels. Experts noted that some athletes at risk for OT may get lost in their expectations when they set goals to win everything, or when they have success as a junior and get carried away with how quickly they will achieve their dreams.

What are their performance expectations? Can they genuinely do what they think they can do? Sometimes then there's a place for putting them in the lab and testing them, because certainly you get some people who delude themselves as to just what their capabilities are. . . . They might find themselves in trouble, chasing those delusions.

Kids of 16 and 17 who were meant to be going to school and doing year 11 and year 12 and "I am at the AIS, on a basketball scholarship. I'm going to go into the NBL and then I'm going to go to the NBA and I'm going to go to College. Look it's easy street. They're going to pay me a million there." You realise that these

kids need their horizons broadened. . . . These huge expectations will lead them to do stupid things.

In juniors they think the next event is the most important in their lives. You know and I say, “Hang on. Who cares if you’re under-19 champion?” If you set your goals too high and push too hard now, who will care when you’re 25 and you’re washed up. “How did you go when you were 25?” “Oh I got an injury and couldn’t compete.”

If their expectations seem unrealistic, given that they have been in the sport for a long time. . . . You know they are getting starry eyed and seeing all these unreal - like the realistic side has gone and the unrealistic takes over. Unrealistic expectations . . . overtraining comes in.

In the past, his goals were all result based and that was a big issue and I think with overtraining they are looking so much at the results and forgetting their process. You look at your season; you don’t want to peak at the beginning of an athletic season. . . . So, if their goals are so result based that they have to win everything, that’s ridiculous.

Some experts noted that the combination of high aspirations with low achievement might lead athletes to unrealistic expectations, driving them to train harder and neglect recovery.

You also see the other side, people on the bottom side of that -- people who have . . . low self-esteem that have identified areas, goals, that seem to be high-end goals, such as world championships, world records. So they have identified high-end goals, but they are very low achievers [relatively]. High aspirations, low achievers.

People who are not quite so talented, but extremely diligent when it comes to training and they’re the ones that are really important. They are the ones at risk.

Experts also suggested that athletes at risk for OT may compare themselves to unrealistic role models. Such athletes might try to emulate particular sporting figures that either are at performance levels beyond what is currently possible for the aspiring athletes or have such different physiological capacities that comparison becomes nonsensical. The at-risk athletes might also try to achieve what others are achieving, who are in roles or positions on a team that are not comparable to the aspiring athlete.

I think some distance runners have a tendency just to say, “Oh, Moneghetti runs so much every day.” And they just say “OK a lot is great. More must be even better.”

If a ruckman all of a sudden starts comparing himself to the athletic ability of a centre player, I’d be thinking that’s not your role. You are priming your body for your role. So when that sort of stuff comes in you go, there is something wrong. . . .

It has been more results based, like “He’s getting more possessions. He’s getting better results. He’s doing this. I need to get those results.”

That’s when they start comparing themselves to the older guys saying, “Oh, when he had this injury this is what he did.” And they lose their . . . own personal story.

Summary of athlete beliefs, attitudes, and expectations. It appears that experts have described some athletes, at risk for OT, as likely to maintain a number of maladaptive beliefs, attitudes, and expectations about training, performance, and recovery. Experts suggested that the more is better approach to training is pervasive among at-risk athletes; this approach may be associated with beliefs that one has to make up for missed training, or that recovery days are counterproductive. It also seems that athlete education and awareness about sport science are important to consider when assessing OT susceptibility. The belief and knowledge structures of athletes most likely will contribute to decisions surrounding training and recovery, and, as experts pointed out, could lead athletes, who have maladaptive beliefs, to unrealistic performance expectations, and greater risk for OT.

Athlete Behaviours

This major category includes descriptions of athlete behaviours that might contribute to the risk for OT. Experts’ suggested that at-risk athletes might be go to extremes with certain behaviours, like those involved with eating, nutrition and weight loss, or those involved with doing extra training. Within this Major Category, there were two subcategories, comprised of the following: a) Risky behaviours surrounding eating and nutrition, b) Risky behaviours related to always doing more.

Risky behaviours surrounding eating and nutrition. Although many athletes strive to maintain optimum health in order to reach peak performance potential, some athletes get involved in risky nutritional strategies, drastic weight loss practices, and disordered eating for a number of different reasons. Experts commented that disordered eating, weight loss practices, and body image issues can be tied to OT behaviours. Some experts suggested

that sometimes athletes are at greater risk for OT because they are underweight or undernourished, whereas other experts commented that some athletes may engage in OT to cut weight and compensate for body image issues.

They're the ones . . . anorexia nervosa sorts of problems. They have to be doing something the whole time; so, they are just inviting problems, constantly, with respect to overtraining.

For one of the girls it was, she started to overtrain, because a couple of new girls had come into the team and she felt they were slimmer than her.

I have seen . . . somebody come along and they've got some sort of overtraining type of problem. . . . You could look at some of the issues of anorexia, but sometimes people present, mostly girls rather than guys, as being in an overtraining situation. . . . Whether their overtraining leads to anorexia or anorexia leads them to overtraining, it's a bit hard to say, but you've got that sort of overtraining.

Probably a better example is with body composition. Certain athletes like this one, she wanted to get as lean as she possibly could and she would also say, "Geez, I'm fat. Oh geez, I'm fat." You'd say, "No you're really lean." "But I could certainly lose fat here." "Genetically you carry more fat on your legs. That may always be, but you're very, very lean." "Oh. Well, it's one thing for you to say that, but I know I eat like a pig. I could certainly get leaner." And when she did get through training - she was leaner, but she just kept saying, "I'm getting leaner. I'm getting lighter. I'm getting leaner. I'm getting lighter." But she just kept training and was just chasing it to death.

Experts also noted that some athletes at risk for OT might be observed to be cutting weight drastically to gain perceived performance advantages, or in some cases to make particular cut off points in weight-class sports, which, unfortunately, might be endorsed by the coach.

He became obsessed you know that his VO2 Max would improve if he dropped weight, because it is measured in litres per kilo. Easy to work out the equation, and so the kid's only a kid about 18 or 19 and he's anorexic. I mean it got to the point where he dropped 10 kg starting out at like 63 and he's dropped 10 kg.

I had a kid that Australian National Junior Championship, and may have been selected for the World Juniors last year. One of the officials came to me before the event started and said, "Look, can you have a look at this kid for me? He's trying to make weight and I don't think he should." I put it to his Turkish coach - a Turkish Club in Sydney - and there's this pale, dried out chip looking really sick and I took one look at him and said, "No." I said, "How are you doing?" And he said, "Oh geez, I've only got another kilogram to go." And I said, "How much weight have you lost?" And he said, "It's 7 kg." I said, "How long?" "In three weeks." And he said, "I've only got a 1kg to go." I said, "You're out and that's it." And I saw his coach; I said, "What are you doing?" "Oh," he said, "We've done this before."

Risky behaviours related to always doing more. Often times in competitive sport, athletes are applauded for their efforts to push harder, to train harder, to do more to achieve their goals. There are limits, however, to how hard athletes can push while still maintaining performance levels; yet, some athletes seem to neglect these limits, consistently. Most experts pointed out that athletes at risk for OT tend to do extra training or to push themselves to do more than others in any way possible; furthermore, there appear to be quite a few behaviours associated with doing extra, sometimes easily observable, sometimes not so easily observable. According to the experts, some of the behaviours associated with doing extra include doing more training than what is on the training schedule, often without communicating about the extra sessions.

He was doing more training than I prescribed and not telling me. So, I wasn't giving him enough recovery; I was only giving him recovery for what I thought he was doing and he's going out and doing extras.

There are ones who feel the need to do the secret training. . . . The coach thinks everything's under control, and they're doing all the right stuff, but then they just sneak off and do another session sometime. Of course they get themselves into trouble; and, often with those sorts of people it is hard to find out.

You say to them, "Have a rest day today." If you are doing your job, and you don't see them, you've got to assume that they are having a rest day, but this guy wasn't. He was just going somewhere else to play and none of us knew until, somehow, through the grapevine of the sport, somebody said, "Oh I played him yesterday." And we are like, "What?" And he said, "Oh yeah. He's been playing this comp for weeks." "What are you talking about? This is his rest day." And so then we cut him back and then he said, "Oh, now I'm not doing enough."

Some experts suggested that athletes at risk for OT might be guarded in their communication and may lie or distort the truth when confronted about their extra sessions.

There is a lot of guarding on what they tell you; there are a lot of things they get really weird about. . . . [The coach] says, "You did six laps." And they say, "No, I didn't. I did five." They're trying to cover up that they've done that little bit extra.

If you do everything you possibly can, and you trust that the athlete is having time off when you have scheduled that, you know there is always going to be someone that will lie to you because they think [doing more] is better.

The other thing is all the shop talk [with other athletes] that happens when you have a dinner and [the coaches] say, “Where’s so and so?” “Oh, he’s in the weight room.” “But we did weights this morning.” “Oh, he’s doing double; the guy is going crazy.” “Really?” So then I am talking to him about how things were going and he doesn’t mention it. . . . I say to him, “So, you’re doing weights twice a day?” “Oh, just actually stretching there, feeling tight, so all I do is go in and stretch.” And I’d say, “Some of the guys said you were actually lifting.”

Other experts noted that some of the behaviours associated with doing extra training are more observable, such as when athletes explicitly do more than what is asked during a training session, or when particular athletes spend more time at training than other athletes.

One particular athlete, a runner, the warm up may be five laps, a really casual 5 laps. . . . Yet, for some reason, this athlete wants to finish the warm up first, and you’ve told them to do five laps; they do six laps.

If somebody said “Listen you’ll swim better with skin fold measures of 45mm.” Then he’d go to 40. “You’ll swim better doing X number of km in a week.” He’d go X km plus. And he worked on his technique; he worked on his diet; he worked on everything.

You can change the environment. A coach can say to the athlete, “Listen, instead of doing 12 sessions this week, I want you to do 10. And instead of doing this number of kilometres, we’ll do X minus.” You’ll find the athletes will go out and do extra stuff themselves anyway.

He’s one of the one’s at the club that everyone sees as never taking the easy road. He always turns up to training early, however long, and is always one of the last to leave.

Find the people who are throwing in extra sections and doing extra things. . . . They just seem to be pushing too hard, given that they should know better.

A few experts commented that some at-risk athletes even talk openly about doing extra, proud to have done more than others, or may be held up as an example for other team members to follow.

Now you might find that, actually, people quite easily respond to that because usually it’s a source of pride, “I am not only doing what I’ve been asked to do, but I also throw in this and a that.” . . . You’ll probably find people who will self-report if they’re doing more, again because, probably because they consider it a source of pride.

He loves that reputation [as someone who trains extremely hard] because he thrives on setting the example. . . . He is so positive for the young guys coming through,

the older guys respect him, like his whole, everything to do with how he approaches his footy is so respected by everybody at the club.

For some athletes, it seems that their emotional responses to missed training and/or reductions in workloads have strong influences on their tendencies to do extra training. Experts noted that athletes at risk for OT might respond to missed training, or reduced training loads and/or intensities, by feeling guilty and then training harder to alleviate their feelings of guilt.

Well he'd rest and then come back and of course he'd feel guilty because he'd missed sessions in the pool. So, he'd train harder and then get sick again.

He would feel exceptionally guilty if the coach backed him off, exceptionally guilty.

They feel very guilty if they can't train or if they are not training hard enough, or if they miss a session, or parts of a session weren't up to standard, up to world class standard. So they go out and flog themselves even harder in the next one to make up for it.

I think the guilt about not working hard goes with the work ethic side. So, the higher the guilt, the more likely the person is to be pressing the "try too hard" button all of the time, which means they're not going to rehabilitate well. Which means they fully expose themselves to further injury or further illness.

Looking at the relationships among behaviours related to doing extra, recovery, and injury, experts commented that athletes at risk for OT will often neglect to take rest days, or will try to come back too early from injury rehabilitation. Experts also noted that some athletes will continue to train despite experiencing new injuries or niggles.

They're not really showing that they take rest days, or take good recovery. They don't have normal patterns of recovery.

Those people tend to come back too quickly from injury, they come back too quickly from illness because they can't be away from the training track, they have a need to be there.

Female in her early 30s, elite, history of injuries but does not give another feedback to modify her sessions because she feels like she would be weak if she had to modify a session downwards. So they might have three 1000s and she gets an extremely sore foot on the first one. She doesn't give any feedback to the coaches, and halfway through the third one they stop suddenly. The coaches might say, "What's the matter?" "My foot is fucked." "Since when?" "It started to hurt after

the first one.” “Why didn't you say anything?” “I didn't think it was too big a thing and you know I wanted to do the session and it was going well.”

Athletes who tend to do extra training may also be looking for multiple ways to get a performance edge. Experts suggested that athletes at risk for OT might attempt to combine a lot of different types of training, and to put together training programs from many different sources.

Look for the athletes who tend to use a lot of sources. They go and find a fitness trainer over there, and they love what that fitness trainer does. Then they have a coach over here, but then they have somebody else as well. They've got a lot of sources where they are getting information about how to train, and they are taking a pilates class, but they are also doing a yoga class and they are also at the gym doing weights. . . . None of those sources are connected to one another, because what starts happening is, by the time you have put all those programs together, you don't have one program, you have a whole bunch of programs.

Many of those athletes then will go and find somebody else whose got some magical little thing that they do and it . . . might be perfectly fine in itself, but it is just an addition on top of [their regular training]. There are certain athletes that you run into that are out there sampling everything. They are often the same ones that are getting herbs from the herbal shop, and they're getting something else from the sport nutrition place, and they're getting something else, and they're reading the zone diet over here; they're just picking bits and pieces from everywhere.

Finally, experts suggested that athletes at risk for OT might also tend to do a lot of extra activities in addition to their sport.

This particular athlete that we had in here last week was just totally overtraining in every possible way. When they weren't physically training, they were doing 24 hours reading psych books and there was absolutely no break, mentally or physically, from sport. It was just crazy.

The thing that you'd be looking for is people who pile tonnes of stuff right on top of another, you know, do a whole lot of different activities on the same day.

Summary of athlete behaviours. According to the experts, there appear to be a number of behaviours that are characteristic of athletes who are susceptible to OT. Some athletes at risk for OT might engage in risky behaviours related to eating, nutrition, and weight loss, and may take measures to cut drastic amounts of weight in short periods of time, or may get trapped in disordered eating behaviour, because they compare themselves

to others perceived to be slimmer. Experts also reported that OT-susceptible athletes frequently engage in extra training, about which many of them are secretive; such athletes often feel guilty about missed or reduced training and respond by doing extra sessions; they may try to come back too early from injury; they may always exert extra effort in many other aspects of their lives as well; and they may combine multiple training programs in trying to get an advantage. Although not all of these behaviours occur in OT-susceptible athletes, and some of the behaviours are not always easily observable, the experts suggested that being aware of these behaviours, where possible, can help to identify athletes at risk for OT.

Introduction to General Dimensions 2 and 3

As mentioned previously, two general dimensions emerged from the analysis related to the situational variables that predispose athletes to OT, a) Situations, factors, or people that pressure athletes to increase training, and b) Situations, factors, or people that affect athletes' needs for recovery. These two dimensions accord with Kenttä and Hassmén's (2002) model of OT, in which they conceptualised OT as resulting from imbalances between stress and recovery. On the one hand, athletes might feel driven to do extra training, which upsets the stress/recovery balance; on the other hand, athletes will experience stressors outside of training, which require extra recovery, also upsetting the stress/recovery balance. In practice, these two dimensions are intimately tied to one another, however, and there is overlap among the variables that might influence athletes to increase training behaviours and those that affect athletes' needs for recovery. For example, during the lead up to major competitions, not only might athletes feel motivated to do more than the programmed amount of training, but also they might experience stress and anxiety in anticipation of the upcoming competition, for which they need extra recovery.

When interviewing the experts, I asked them to describe what they thought were risk factors for OT, and to describe their experiences working with athletes who had overtrained. Several experts explicitly pointed out situational factors that had lead athletes to excessive training, as described in General Dimension 2, or situational factors that increased overall stress and affected general recovery, as described in General Dimension 3. Nonetheless, several experts also talked about risk factors without indicating whether the factors motivated athletes to increase training or whether the factors affected athletes' recoveries by adding to the total stress load. I found, however, that I could group the majority of situational variables into either General Dimension 2 or General Dimension 3. Furthermore, this dimensional classification between the different situational variables represents an important shift in defining and understanding OT, in that OT goes beyond simply doing excessive amounts of training; OT also can arise from a context of moderate training, but with the existence of other significant stressors that disrupt recovery.

General Dimension 2: Situations, Factors, or People that Pressure Athletes to Increase Training

Looking at the people and circumstances, surrounding athletes, that might influence their OT behaviours, experts offered several opinions that related to General Dimension 2, situations, factors, and people that pressure athletes to increase training. General Dimension 2 encompasses the factors that drive or motivate an athlete to do excessive training; these are factors that upset the balance between training and recovery through pressuring athletes to increase training behaviours. General Dimension 2a comprises four major categories, which are a) Behaviours and attitudes of coaches, b) Behaviours and attitudes of family and others, c) Specific sport factors, and f) Socio-cultural factors. The major categories of General Dimension 2 are addressed in the following sections.

Behaviours and Attitudes of Coaches

This major category includes descriptions of the behaviours and attitudes of coaches that might influence athletes to increase their training to excessive amounts. Within this major category, there were three subcategories, comprised of the following: a) Factors related to coaching experiences, b) External pressures on the coach, and c) Coaching style or focus.

Factors related to coaching experiences. Several experts suggested that coaches, who lack experience in any area of coaching, can put athletes at risk for OT. On the one hand, experts noted that some coaches may generally lack experience, which, when combined with an overzealous approach to training, results in loading up the athletes with too much training.

You get some coaches, particularly if they're relatively new, they get incredibly enthusiastic about it and then want the athletes to do more.

On the other hand, some coaches lack experience working with a specific group of athletes, which might influence decisions about pushing harder in training.

You can't push the senior athletes like you can an age group swimmer because they don't regenerate as quickly and I think that some coaches that deal with age groupers have a problem dealing with senior athletes because they think they can treat them the same.

Experts suggested that, for other coaches, the experience of success and notoriety might interfere with balanced training practices. Experts pointed out that when coaches have large pools of athletes from which to select, or have some athletes who have succeeded on high-volume training, they are more likely to keep employing the more is better approach, because the successes have reinforced this approach, at least for a select few athletes. The problem with the high-volume, one-program-fits-all approach, however, is that many good athletes can get injured or overtrained along the way.

If you get enough good athletes, it doesn't matter what the training program is, some are going to succeed. You get a bad coach, if he's just a numbers coach and

gets good athletes, they will succeed. And that improves his profile. It just reinforces that whole cycle of bad coaching, bad, high-volume coaching. It is possible for a bad coach to screw up a good athlete and this coach has screwed some really good athletes.

He has a very strong influence over those devotees of his. Though I think that's another potential risk factor, and he thinks that because he has got one natural kid, who has done well on high-volume, that means his message must be correct.

One of the risk factors is a highly acclaimed coach with a big stable. He doesn't need to maximise individual performances or he hasn't got the time to get to it. He thinks it's too important to be worried about everybody's individual little psychological foibles or individual foibles anyway. So, if he has a few dropouts in his program, who cares? Because people are only just reading about his medal winners.

External pressures on the coach. Ostensibly, some coaches might feel pressure because they are scrutinised by the media, parents, sports institutions, and funding bodies for their athletes' performances. Unfortunately, as experts commented, some coaches might react to this pressure to make themselves look good by pushing their athletes to excessive amounts of training.

Coaches are under pressure to have success. God, didn't we see it with [this sport] and so they actually then go with blinkers on as well.

That's the sort of thing of course that can lead to the sort of problem we're talking about, overtraining. If you've got a coach who is under a lot of pressure and is asking more of the player than they can give.

One expert also noted that, in other circumstances, coaches might be motivated to promote *more is better* training programs because of financial incentive; according to the experts, it is easy to sell people on the concept of high-volume training.

If I were a commercial coach, and I wanted to be a successful commercial coach, unfortunately . . . it would be much easier and commercially successful for me just to embrace the *more is better*. I wouldn't have to sell anybody on anything. They've already been sold. Their whole upbringing is based on *more is better*. I would just be reinforcing what they are socially pre-disposed to believe. For me to go to them and say, "Hey that's not the way," I would have to be a remarkably good salesman to sell them something else.

And the commercialisation of coaching is a real factor and in [my sport], there is one coach, in particular, who . . . is really doing such a terrible job, but he is making so much money out of it, you know he is a level one coach for God's sake.

This guy knows nothing, but he's making a lot of money out of coaching people, based on this *more is better*, and he is absolutely a used car salesman.

Coaching style or focus. A coach's general approach to coaching, and interpersonal style when interacting with athletes, can have impact on how hard athletes push their training. Experts suggested that coaches, who express win-at-all-costs attitudes and advocate *more is better* philosophies, are likely to put their athletes at risk for excessive training.

Coaches with a mentality of you know with a win at all costs type, simplistic mentality, where winning is not the most important thing, it's the only thing. I think that kind of psyche, while it can be very powerful, and it makes great headlines, I think is intrinsically dangerous.

As soon as one athlete comes along and succeeds on an incredibly high volume program, that is just undermining. . . . The coach will say, "Look. There you go. More is better. Told you so. Look at that athlete." "Yes, but hang on a minute, I've got all these other athletes." "Oh well, no. They were just genetic freaks." They're genetic freaks. See, *more is better*. It's so easy to sell.

The bad ones just go on the principle, "Well, I'll just keep giving them heaps and heaps to do and we'll see who comes out on top at the end."

Furthermore, experts commented that coaches with short-term goals, or those who focus on single performances or results, might drive their athletes to train too hard.

Physiologists are very, very selective about what information they release back to the coaches because, if the coaches look at it in raw number terms, you know like it can look really bad and they can get incredibly down. Some of the coaches are sort of famous for obsessing about these sorts of things, and driving their athletes to poor performances, because the coach clearly becomes so worried about bad, single number results, when in fact the athlete is perfectly well.

Coaches are all important because they again will sort of hang their hat on one result.

A big risk factor is a coach who, for one reason or another, just wants a performance short term.

Finally, the style with which a coach communicates to athletes can influence how they push in training. Some experts pointed out that situations with autocratic coaches inherently create OT risks for athletes.

The coaches that are not as secure with themselves say, “By God, this is the way we do it. This is my program; it creates champions. If you can’t cut it, you were never meant to be a champion. Don't talk back to me. I don't want to hear about your problems. I don't have time for that.” It is a very autocratic, feed-forward, put up or shut up mentality.

You have a very powerful person, who cannot be challenged. . . . The coach is this powerful person and you are away from your family, then that coach becomes the primary role model, the primary attachment figure. . . . To maintain attachment, you will seek approval. Young people will seek approval . . . and, in sport, approval will be there for going the extra mile.

Summary of behaviours and attitudes of coaches. There appear to be a number of significant factors to consider when trying to understand how different behaviours and attitudes of coaches might influence athletes’ choices to push excessively in training. In some cases, the experience level of the coach, the specific focus of a coach’s experience, or a coach’s experience with success can affect athletes’ motivations to increase training. Experts noted that some inexperienced coaches can get over-enthusiastic and encourage increased training volumes. Other coaches might only have experience with one type of athlete population and, thus, hold another athlete population to inappropriate standards, whereas, some coaches, in response to success, communicate that only hard work brings about that success. For some coaches, external sources of pressure from the media, or from financial incentives, can prompt them to ask for increased training efforts by their athletes. For other coaches, *more is better* coaching philosophies, short-term, results-focussed approaches, and non-communicative or autocratic styles of coaching, might leave athletes feeling they have to push harder in order to keep the coach happy.

Behaviours and Attitudes of Family and Others

This major category includes descriptions of the behaviours and attitudes of family and others that might influence athletes to increase their training to excessive amounts. Within this major category, there were two subcategories, comprised of the following: a) Parents’ and others’ reinforcement behaviours, b) Parents and others seeking personal or

financial gains.

Parents' and others' reinforcement behaviours. Similar to the coaches, family members and significant others in athletes' lives, can have strong influences on how hard athletes push in training. Several experts suggested that the ways in which families and friends reinforce athletes' drives to do more can increase OT risk.

He came from a family where how hard you work was important. You were often judged on how hard you worked, maybe even over and above the end result. It was the effort you put in that was important. He came into the program with this extremely strong work ethic. Some athletes have that and I think it's a product of their background.

Maybe that's a part of the personal package, "How much are they driven by parents?" And some athletes are driven a lot by parents. Whether they consciously understand that or not, they are driven a lot by parents.

Look at the people who are around that person, because it is very, very often that you've got one or more parent, team-mates, or siblings, or best friends, who also believe that *more is better*. Take a look at the support system around - Are there people that actually understand sport, understand the human body? Or do you have a lot of people who are very outcome-oriented and very much about work ethic? "You've just got to put in the time, put in the yards." Because it's often the case that athletes feel pushed to keep moving, or they're reinforced for the pushing.

Experts pointed out that, in some sport contexts, athletes, who train excessively, are exalted as examples of great work ethic; furthermore, within the sport, reinforcement for OT behaviours might also come from a variety of sources beyond the coaches, such as from physiologists.

Well the catch 22 also, Sean, is that this guy's work ethic was a model for other people to follow. And it's reinforced every time he turns around.

I think elite sport, particularly, is facilitative of this type of behaviour, that it generally gets rewarded.

You'd want to look at what sorts of influences they are getting from other significant people in sport, other sport science people. You know there are some people who are very much influenced, for example, by physiologists who say, "Listen, you know if it's good to have a skin fold of 50mm, then it's got to be better go to 40mm. If it's good to train this hard, then it's better to train this plus." So, not just coaches, but I'd look at the significant others that surround the sporting environment for that athlete.

One expert commented that overtraining could be viewed as a sanctioned, self-medicating type of behaviour in which athletes engage to alleviate stress and anxiety.

So you train hard, you know you are always doing that extra mile kind of thing and you get rewarded, so it legitimises what, in another context, we would look on as perhaps self-medicating behaviours . . . such as with drug and alcohol abuse or eating disorders. So, people use various methods to modulate their anxiety and their distress, and overtraining is a very nicely rewarded, sanctioned way of doing that.

Another form of reinforcement for OT might be associated with athletes seeking parental approval or love. Experts commented that some athletes might not have received praise from their parents, but kept trying to get approval through their sport achievements.

Experts also noted that, for some athletes, parental approval and love were contingent upon successful performances in sport. Thus, the athletes engaged in OT to try to win the love of their parents.

Now what drives that person to do that, you know, it's probably something back in their childhood that they're still trying to please their father who used to be a bit of an ugly parent and no matter what that little child tried to do he never got praised for anything, right, so when you are looking at overtraining, it's a very complex issue.

For some it actually breaks doesn't it and gets to the point where some will never feel secure enough or have sufficiently high self esteem to make them really feel that they are successful in the end. It doesn't matter what they achieve. It's like you've got to keep climbing, climbing, climbing because it doesn't matter what you do you never feel adequate. I think those sort of things come from parental influences.

You can look at their relationship to the parents and you can look at what has happened to them in their developmental stages to get to why they are elite athletes. I have an athlete now, for example, who was a very, very high-level performer, world champion, but also had disordered eating, abuses himself, physically, in lots of different ways through [excessive exercise] and other sadomasochistic types of issues. But everything he has always done has been about parental approval. Everything he has always done has been about having Mum or Dad say, "You are wonderful because you're an elite athlete." So his motivations have always been externally driven, not internally driven. . . . He has had a lot of issues with overtraining. In fact, he was diagnosed in [past] Olympics as being overtrained.

In some cases, the reinforcement for OT might come from family members who are very involved in the athlete's sport. Experts commented that some athletes may feel pushed to

train excessively when their families were very achievement oriented and/or where they became very involved in many aspects of the athlete's sport and training.

You can see where this comes from because mum is taking them from this to that and dad takes over and takes them to the next thing. They've got this incredible lifestyle where the whole family becomes focussed on getting these kids to achieve certain things and at some point the poor old kid fails, often times through no intent of their own. They're really keen to keep doing it, but they just can't do it

Athlete is competing in Europe. . . . His wife is extremely concerned about his performances. . . . She knows the particular sporting stream really well and the sort of pressures this guy is under. . . . I saw him yesterday. . . I said, "Well, she sort of runs the show." He said it was pretty interesting; she's got his entire career mapped out.

Parent involved who just wants success out of their kid no matter what, and they are probably not listening.

One expert pointed out that athletes might be driven to train harder, despite injury, when family and others are anxious about these athletes' time off and do not support proper recovery for injury or fatigue.

So, I think, if you're going to look at high risk people, you definitely take a look at the kind of support system that they have around them. Do they have people who are also getting anxious because of the fact that they are injured? Because that's really hard to take if you're going home every day and a partner, a parent, somebody else is worried about the fact that you might not get back, "Oh. You're not going to make the Olympic Games." That will also drive you. You say, "Well. I've got to be doing something. Ok, well, we'll sneak in some extra secret practice. My hammy is not feeling that bad. So, maybe if I just start doing a few things." The next thing you know there is an injury there.

Parents and others seek financial or personal gain. Many athletes train hard to earn contracts and endorsements, which can help them to support their commitments to sport. These commitments will often put extreme pressure on them to train harder. Experts pointed out, however, that some family members and others add to this pressure, when they seek their own personal and financial gain from the athletes' sporting achievements.

Especially because those parents, obviously, tennis is far and away the prime example, see their children as a meal ticket. In no way do they want their child distracted from anything but their tennis career. You know they would see that teaching them anything else is just a distraction and there's a negative and so you can run into some fairly important barriers and influences.

Sometimes the pressure is not so direct, nor is it always financially motivated. One expert commented that athletes might be at increased risk for OT when parents have been involved or are still involved in competitive sport; it seems that some parents may see their athlete children as reflections of themselves.

I think that's a large part of that rowing ethos, so that's why the parents, because they're in that same thing themselves and often rowed themselves, that's what they want to see their offspring doing and pushing and so there are a lot of pressures that extend well outside the actual sporting performance that have been manifested as sporting issues.

In some instances the pressure from parents for their children to do well in sport might seem to originate from pride; in other cases, experts pointed out that parents might be pressuring their athletes to achieve to compensate for the parents' own feelings of self-dissatisfaction; they might be trying to live vicariously through their child's success in sport.

For example, the parents who really want to see this child succeed. I think a lot of it could be because of parents dissatisfaction in their lives. You know, single parent for example, who is putting their all into this child. Relationship in a marriage that isn't working very well, again is focussed on the child.

Family colluding in the elite gold medal dream and putting 5 year-old kids into program, you know, because the parents are living their lives through their children. That's another area where you're going to have something happening with overtraining.

Summary of behaviours and attitudes of family and others. Influential people in athletes' lives, especially family members, significant others, and people within the athletes' sports, can have impacts, through their direct and indirect demands on the athletes, and from their patterns of reinforcement for OT behaviours, on whether athletes choose to push excessively. In some cases, family and others espouse *more is better* attitudes, and very hard work ethic approaches to training. In other cases, people within the sport, such as physiologists, make comments that encourage overtraining behaviours.

Some family members exert pressure on athletes to train harder because they seek financial reward from, or attempt to live vicariously through, their child's athletic achievement.

Specific Sport Factors

This major category includes descriptions of the factors directly related to the athletes' sports that might influence athletes to increase their training to excessive amounts. Within this major category, there were five subcategories, comprised of the following: a) Pressures to gain financial reward or support, b) Timing or scheduling factors, c) Demands of sport related to physical factors, such as weight or age, e) Factors related to the sport/training environment or culture, and f) Transitional factors.

Pressures to gain financial reward or support. In most, if not all, sports, there are significant pressures related to money. Experts noted that pressures to earn professional salaries, to win monetary rewards or prizes, and/or to gain financial support from government and/or other institutions might motivate athletes to train excessively. In particular, some experts commented that athletes might feel pressured to live up to expectations implicit in signing professional contracts.

In these days of professional athletes, and I include government-funded athletes as professional athletes, all of the contracts now are performance-based contracts for coaches and athletes. So, no matter what you or I might say about the importance of life balance and the importance of recovery, that's always going to lose out to having to produce the performance.

There's an awful lot of people who get paid and so there's money involved as well. It's extraordinary, and they are pushed enormously

Professional teams are there to service their sponsors, day after day, after day, right throughout the whole year. The pressure is on basically every race. . . . It makes it even more difficult in the professional situation when you're paid to go to work 9 to 5. You might be over-raced two-thirds of the way through the season. . . . Just getting up from one day to the next. The male pro cyclist has just got to get out there and do whatever they have to do to earn their keep.

Similar to the pressure on athletes implicit in a contract, prize monies, rewards, and other financial incentives can have influences on athletes' motivations to push harder. Experts

pointed out that some athletes might feel pressured to increase training or to play injured to receive such bonuses or prize money.

Why does a footballer not want to tell you if he's injured? Well the difference is, if he's playing, he gets \$5,000 for the game, and if he is not playing, he gets \$500. What would you prefer? . . . They push themselves. They really push themselves to absolute extremes. They don't care about their own personal health. They're not thinking long term, they're not thinking philosophically. I have seen it with the VFL player who gets injuries, who keeps on going in there, thinking of the \$5,000 they're getting for the match. They're not thinking of what they'll be like when they're thirty.

You're, say, a triathlete. If your performances don't improve, you're not going to get the money. So . . . it is money driven.

So, if they get a really good result and they win a \$10,000 event, then I can see easily how the almighty dollar could consume their training. Like, "I did this much training and I won this event and I got this much money. Let me do this much training so I can win this event, which is worth more money." That's where it's dangerous.

For many amateur sports, funding comes from government and other sport institutions.

Experts noted that athletes might feel the pressure to train excessively when it is suggested that the sport funding is contingent on athletes' successes.

The controlling bodies, for example, with Tae Kwon Do, we have the Australian Sports Commission say, "Well, OK, your funds are dependent on your results at the Championship. We want results. We want top 10. We want medals."

It was almost obscene for the Olympics, because when the Australian Sports Commission had about 4 years out from the Olympics, [I could imagine they would have said] "We're interested in medals at the Olympics that's it. We don't want you wasting any money on the *maybes*. We want to put all our money into the team you've got to make sure that they have the best possible chance of winning a medal. That's all we're going to be judged on, whether we achieve medals."

What they were interested in, short-term goal, "We want the Olympics. That's it. For 2000, that's why our money's here. That's what the politicians are giving us the money for and that's all you're getting money for."

Timing or scheduling factors. At particular times of the competitive seasons in sports, athletes might be likely to feel pressured to push themselves harder than usual.

Experts noted that, during times of team selection, athletes might engage in a number of risky behaviours, from pushing through injury to not communicating about fatigue or other

problems; athletes who feel they are on the cusp of not getting selected might be particularly at risk of pushing harder.

There was one guy, he was not a key player as far as the senior side goes, but just making the senior list, which was like 42 players and now its 38, just making that senior list, his big step up. Then they get injured within the first 6 weeks and then they are like, "I've just got a thing. I have to prove myself." And they think that they are not going to be noticed by the coaches . . . as much because the coaches only care about your top senior guys. So, they start doing stupid things.

They feel they need to prove themselves to the coaching staff to stay in their position.

I guess the problem is getting honesty from the athlete because a lot of them are too frightened to actually say they're fatigued or they've got a problem because they might not get picked for the team.

You definitely want to look at those things, like the proximity of up-coming competitions. It's not just the proximity, but the importance of up-coming competitions. . . . For some athletes . . . the selection can be the most important competition, because to get on the national team is the most important thing. . . . Once they're on the team they're not so bad, but it's getting on the team that's the tough spot. Even a competition semi-final can be a much more important race than the final, because getting into the final might get them selected. But it's getting into the final that's the hard thing.

During the lead up to major competition, athletes might feel the most pressure and/or motivation to increase their training. Experts commented that prior to competitions, such as the Olympic Games or world championships, or other major events, many athletes might push excessively.

The motivation for an Australian athlete leading up to these Olympic Games was unbelievable.

That's that complex syndrome of high level training, high volume training with psychological pressures that go with coming up to big competitions.

I think, when the crunch comes at major world-class competitions, the coach will usually always opt for what they think is necessary for the performance. Rarely is that going to be to take time off.

You see girls in different National teams around the world that you get to talk to from time to time and they say, "Oh, I know I've got the Hewlett Packard Tour in Idaho coming up, so I am just going to go out and ride hard." And that's where you see overtraining issues come up.

She had the most disappointing results you can imagine, probably one of her worst results ever at international competition, and it was at the Olympics. She probably had a chance to medal or at least go top five. If we could have had her two weeks earlier for that [race], she would have ripped it [apart].

Experts pointed out that this push for athletes to increase training prior to major competitions might also be associated with increases in illness.

And then he'd come back and train harder and train harder. Sometimes he'd get sick, of course, before major competition when he would want to train the hardest.

Well you see, of course, in Melbourne with the marathon, the Melbourne Marathon's held in October, it's common to see the marathoners in September and they all come in with sore throats, actually. What we saw was they come in with a sore throat. "Damn it happens every year. I always get a sore throat. I can't understand it." So, that's a common time.

One expert noted that some athletes might engage in drastic weight-cutting behaviours in preparation for upcoming big competitions.

They then go to world championship. . . . They get to international competition and they've got to lose four kilograms in the last week, or sometimes more, two or three kilograms a night and then they come out dehydrated if they make the weight at all

A few experts described how some athletes, motivated by big competitions, might find themselves in a downward spiral of increasing training and worsening performance, as they try desperately to hang on to physical form.

Like this guy here, he was going to the world championships. His form had been great and he just started to lose it, a couple of bad training sessions and you think, "Aw, crap! I am getting close to the world championships. I better try harder."

I think when people have the idea of stepping up for the big competition . . . they see that they need to crank up the volume, maybe more than they would have normally. The problem is that when they take the volume up and they start becoming fatigued, they will often respond by taking the volume up even more, that whole more is better belief. I think . . . when an athlete is coming into a big competition, like the Olympics, those beliefs just take over.

Demands of sport related to physical factors, such as weight or age. Some sports seem to involve demands for athletes to push themselves to achieve certain body compositions, or to achieve high performance levels at very early ages. Experts

commented that, in some cases, athletes might feel pressured to increase training by direct and indirect demands to reduce body fat or skin fold measures.

I think people obviously in high performance environments are obviously going to be exposed to the pressures to train, train, train, “Get your skin folds down. The lighter you are, the better you’ll get over it.”

There’d be some coaches who would want weekly skin folds. Well to me that’s got to the crazy stages. That puts an incredible amount of pressure on athletes to maintain body weight and body fat levels and so on, and it leads to all sorts of abnormal/pathological behaviours.

In other cases, experts commented that there are certain sports in which athletes are expected to enter a high level of competition at very young ages, possibly pushing them to train excessively at very early, and potentially vulnerable, stages of physical development.

The other risk factor that occurs to me is in sports like gymnastics where children, babies are, essentially, being put into sport at an extremely young age, which is, absolutely, systemic child abuse.

In every single sport arena in Australia, the athlete is started off at a very early age and pushed religiously. I mean in AFL they’re touted from a very, very early age.

Factors related to the sport/training environment or culture. Within most, if not all, sports there are often traditions, cultures, and practices that athletes might feel compelled to follow. Experts discussed aspects of the sport environments and/or cultures that can increase pressure for athletes to push harder in training, or to ignore injury. One expert pointed out that the whole issue of overtraining is related to the system of sport, rather than to the behaviour of the individual.

You were asking the question what are the risk factors in individuals, when we go down that track, we are essentially de-politicising the whole issue of over-training and identifying it as the problem of the individual and not the problem of the system and I think that’s a mistake. . . . Your sports system is a problem. So there’s no point asking the question about the individual. You have to look at the sport and start to ask questions at that level.

Another expert commented that following certain training practices, without asking questions about the potential for physical harm, simply because the practices are part of the sport’s tradition, can put athletes at great risk for OT.

So you've got some players who say, "OK. What I really need to be fit . . . The harder it is, the better it must be. Let's do stair climbing" . . . and I reckon stair climbing is a tradition in the martial arts . . . So, they do heaps and heaps and heaps of stairs and what they get is repetition injuries to their lower legs. They just wear themselves totally out, they don't give enough recovery time and then that's when you get into, I believe, overtraining.

A number of experts also suggested that humiliation within a training environment might play a role in athletes' OT; it seems that some athletes are chastised publicly if they do not live up to certain expectations within the sport, such as making weight, or pushing through injury, and fatigue.

There's so much humiliation about not making weight. It's such a disgrace that they often do, don't they, do all the things that are not healthy.

Football has always had the attitude, "You tough it out; you do it for the team. . . . you take the hard tackle for the team." So, you can never train enough. . . . In football, they grow up with "This injury is not that bad. You are soft." People start [saying], "You are soft and you have no pain barrier." Then this poor kid who is coming in and wants to do the right thing, because the doctors are trying to educate them that way, and the first time he says, "Look. I was a bit sore here," a senior guy jokingly will go "Oh, don't be so soft," and that sticks. Because they look so much up to these guys they think, "Oh, if that player says that to me, I don't want them thinking that. They might tell the coach and I might not play."

He'll think, "Well, bugger it I'm trying to be smart and this is the lip I'm getting from the coach, I'm just going to push myself to the limit, and if I want to survive this sport, that's what you've got to do," and that's where illogical stuff beats logic.

In some cases, the pressure to train harder might be a product of a Darwinian selection process. Experts commented that, in some sports, there is a large selection pool of athletes, and coaches will just keep pushing harder to see who can handle the training, without concern for who gets injured or overtrained along the way, a survival of the fittest approach.

They'll push the ones that they can push and those that will respond will stay and the ones that don't are gone. . . . You get dropped straight away, because there are so many to replace you.

The problem there is that they have so many people who would be willing. It's like you're smashing eggs against the wall. You smash 5,000 eggs against the wall; one remains. You keep that one because you've got plenty more and it doesn't matter; so, you have a lot of casualties

In other cases, experts noted that the pressure to train harder may be suggested, directly or indirectly, by comparison to others who are doing more.

We have dissected sport, and when I say we I am talking, collectively, coaches and sports scientists, dissected sport now down to its minute detail . . . and conveying that information to athletes. We are saying to them, “Unless you’ve got all of this right, you are not going to make it, because while you do a little less in a session, or while you eat that and not something else and while your skin folds might be 5mm higher than somebody else’s, there’s somebody else somewhere else in the world who’s doing it right and they’re going to beat you.” And so athletes have this in their face the whole time, over and above what they bring into the situation themselves, and I think when you get that mix of those two things together, you’ve got a very explosive environment.

They all have different needs in that . . . team environment. It’s more dangerous because then you get the . . . issues of, “Why is he doing that training? I want to do that training.” . . . That can destroy a team.

Athletes, especially in an institution like this, watching each other’s coaches . . . hearing what other people’s coaches have said, and what other people have said, this is also an influence for young people. So, even if my coach is really nice to me and you know and says everything is ok and someone else, my friend, you know her coach is saying, “Oh yeah, you know you’ve got to really push out. No pain, no gain,” then already I’m [thinking to myself], “Oh really, Oh.”

Finally, experts commented that there are demands to overtrain implicit in being a competitive athlete; these demands might be seen to evolve from athletes having to experience some level of injury or OT to understand the limits of their physical capacities. It seems that the risks for more serious consequences of OT, however, increase when athletes fail to recognise their limits, or when athletes do not apply what they have learned from previous OT experiences.

I mean there’s always that view too, that it takes some level of trauma for the athlete to actually step aside and take a good look at what’s going on. Unfortunately, for this athlete, the trauma in the form of the fatigue syndrome, the illness syndrome, was sufficient to exclude him from the sport from then on.

How do you make the call and deal with it, because the one thing about not going too far is you never know if you really are there? You know, it’s confusing. You only know if you’ve done enough when you’ve done too much. You know, “Whoa. That was enough.” and that settles you and then you recognise it. But you never know where that is until you’ve tried it.

No elite athlete has a balanced life -- that is what makes them an elite athlete. They have that singular focus and that is their life.

You've got to go through your limits all the time to get those adaptations to go to another level. You can't say, "Oh I'm feeling a bit tired I've got to back off" because you're not going to get the overload adaptations.

Transitional factors. Competitive athletes will go through many different types of transitions in their careers, all of which can increase stress levels. Experts noted that some types of transitions might increase the pressure for athletes to push harder in their training, particularly when athletes make the transition from part-time to full-time training, or when they make the transition to a higher level, or more competitive arena.

Everybody has seen it, "Such and such has gone full-time. Oh, well, he'll be good for about 3 months and then we'll kick his ass, you know, because that's when he'll start to go off."

Frame of reference effects and looking at things like big fish, little pond -- little fish, big pond, which is basically saying that people come from, for example, a basketball player in my little local town who is good, "I'm really good, but if you bring me into the bigger pool, that has an impact on my overtraining. How do I save face in relationship to all these other athletes? I start overtraining."

Experts also commented that athletes returning to training after time off, often forced time off due to injuries, might be motivated to increase training too quickly because they try to make up for missed training, try too hard to regain physical fitness, or want to break out from the frustration of having been inactive during their rehabilitation periods.

An example of another athlete I saw last week, who competed at the Olympics, and then had the usual sort of let down period after the Olympics. . . . Came back to [training] and it took a while to fire up to do the training and then sort of pushed the training too hard. . . . He really decided, "OK, I'd better get my act together," and has sort of done a 4 week block of the sort of quality training that he was used to doing when he had a really solid background, but he's coming to the 4-week block from three months of not doing much at all . . . and then he's feeling fatigued.

The way that they take control of their life is by being active and doing things. Sitting and waiting, which is the rehabilitative process to a large degree, is the antithesis of what they believe [about] actually taking control. So, one of the most frustrating things to many, many athletes and achievement-oriented people is being told that you have to sit and wait and give it time. . . . So, it is a real difficulty if you don't give athletes something to do and don't help them get their mind around the fact that being injured and being in rehab is actually part of being an athlete, but

they struggle with this and may not want to follow the course of rehab, and end up pushing back too hard too soon.

One expert suggested that athletes, especially older athletes, facing the impending transition from competitive sport to retirement, may be at risk for OT, as they fight to maintain training schedules that they had sustained when they were younger. The older athletes might try to push harder in training in attempts to hang on to the length of time they are competing in the sport, afraid to lose their identities as athletes.

If they are on their way out and they start doing more, that's where it's a sign of . . . even though they are . . . overtraining . . . the issue is more, "I have nothing else to go to. I don't have anything else. I am a footballer. That's all I am." and their's becomes more a transition sort of issue. . . . It's always been because they have been scared of losing it, because they have nothing else to go to. They don't know who they are outside football, or whatever sport, so they hold on and push their body when it is not going to do them any good anyway.

Summary of specific sport factors. The experts commented on a number of factors directly related to sports that might influence athletes to increase their training to excessive amounts. According to the experts, financial issues, such as contracts, incentives, bonuses, government funding, and scholarships, can all be motivating factors for athletes to increase training loads. Experts also noted that athletes might feel more pressured to increase training at particular times of the season, such as during team selection and the lead up to major competitions. Some experts warned that athletes might push excessively in sports where there is constant pressures to reduce body fat, or in sports where high levels of performance are expected of very young athletes. Several experts made comments about the sport cultures or environments. Experts suggested that some athletes might be influenced to increase training when they are surrounded by tough sport traditions. Experts also pointed out that athletes might feel extra pressures to train harder in environments with large selection pools of athletes, where coaches can literally run a Darwinian selection process, or in environments where there are constant comparison to others, especially those who train excessively. One expert commented that there are implicit demands in elite

sport, such as having to learn one's physical limits, which drive an athlete to train excessively. Finally, a number of experts noted that athletes might feel pressured to increase training during periods of transition, particularly when moving from part-time to full-time sport commitment, from lower to higher levels of competition, from seasonal layoffs to full training, from breaks due to injury to active participation, and from end of careers to retirement.

Socio-Cultural Factors

This major category includes descriptions of attitudes, norms, and imperatives imposed by the socio-cultural environment that might influence athletes to increase their training to excessive amounts. Within this major category, there were two subcategories, comprised of the following: a) Reinforcement for attitudes and beliefs supporting OT, and b) Reward for pushing very hard in training.

Reinforcement for attitudes and beliefs supporting OT. Societal norms, pressures, and acceptance of particular situations might have an influence on how athletes conduct themselves within their sports. One expert described, in detail, how athletes might end up overtraining when they live in cultures that reinforce or allow abusive dynamics between coaches and athletes.

We really have a socio cultural environment that, in many aspects, replicates the dynamics of abuse. You have a very hierarchal system where enormous power is invested in coaches. . . . We have, I think, come to accept a high level of very abusive behaviours that we would not, for example, accept in the classroom and it is very problematic, because it replicates the abuse dynamic. You have a very powerful person, who cannot be challenged . . . and other people don't interfere with those kind of coaching behaviours because it's elite sport, and it's so special and different and so we replicate the dynamic of a dysfunctional family. . . . We assume sport is good, so we don't interfere, so we open it wide up for abuse at all levels. . . . So, to me, all of these issues are what's going on with how people organise themselves around coping with being in an abusive situation. So, if you're an athlete . . . and you are away from your family, then that coach becomes the primary role model, the primary attachment figure so to maintain attachment, you will seek approval. Young people will seek approval of the primary attachment figure and, in sport, approval will be there for going the extra mile. . . . So, hello,

why are we surprised when this athlete is trying to do everything perfectly and just overstretching every single way, so that they can have some emotional safety?

You know if you want to be successful you have to survive the system and the system itself is abusive, then you have to adapt to an abusive system, so of course you know dysfunctional behaviour is one of the rewarded things.

What options does a child have in our culture with the way we accept the power of the coach? Does that child have an option to actually say to the coach, "I feel really humiliated and hurt when you say I'm fat. I'd rather you didn't say it"?

The expert pointed out that often parents will not intervene, even when coaches are overtly abusive to their children.

Parents stand around and watch the coach yelling at the kid, so what is the message to the child? People are allowed to abuse you and invade your boundaries and no-one is going to do anything about it, so then why are we surprised when the kid ends up with all sorts of dysfunctional coping strategies like over-doing it because, what we are effectively saying is, "Well, if you feel hurt and sad about this, it's your problem kid." . . . That's exactly what keeps the system going. That power structure where it's very clear to you as well as to the kid that no-one is allowed to question this.

Several experts also commented on the prevalence of the *more is better* mantra within society, and how it has become a slogan accepted by the masses.

That's a society thing. Everything in society, *more is better*, isn't it? More money, bigger house, bigger car, faster car, you know, that's society driven. I really think it's a social thing, *more is better*. If *this* much gets that far, *more* will get me further. That's the philosophy.

Again, it's a social factor and I don't think you can overlook that, that *more is better*. That is a social factor and it is very hard to convince somebody that doing less can be very good for them.

As a coach, it would be much easier . . . for me just to embrace the *more is better*. I wouldn't have to sell anybody on anything. They've already been sold. I would just be reinforcing what they are socially pre-disposed to believe.

Typically, the problem with western society achievement is always - *more is better*. More is always better. So, typically, you find the perfectionist and the meticulous person is also still in that *more is better, more is better* frame of mind.

Yeah, I mean, they keep going because of the prevalence of that belief that you've got to work harder, you've got to work harder, you've got to work harder.

Once expert pointed out how the media, and everyone else involved in sport, collude in perpetuating behaviours related to OT, such as competing while injured.

I think it is also fuelled by the media, and the whole kind of hero-worship thing that we do around athletes, especially in this country. So, everyone I think colludes in this myth that *no pain no gain*, and you're a hero if your leg is broken and you can go out there and win the game for your team. I mean this is extraordinarily abusive behaviour to me, where we all collude and the media colludes and a person gets called a hero, accolades.

Reward for pushing very hard in training. Pressures to increase training might also stem from cultural initiatives promoting national pride in sport achievement, sometimes including monetary reward. One expert, who had experience of working with athletes in China, noted that, for some athletes, in some countries, success in sport is associated with great rewards for both the athletes and their families, where sport success can be rewarded with an escape from poverty.

In mainland China, if you can become a successful athlete, you not only become very wealthy and you get a house from the Government, but also your family gets taken care of. So, if you are living in one room, and you've got 10 brothers and sisters, and you're out in the middle of the countryside, and you happen to be very tall, or you know and you get picked up for the basketball team, or something, you are the saviour of your family. So, you are going to be sure you are going to have lots and lots and lots of over-training,

It is different from here in that it's much more compelled by inner poverty and the need to take care of your family and you know do something for your country, so you might have some political safety.

Other experts commented on achievement in sport being part of a national identity in Australia. For athletes, the perception that a country's morale depends upon their sport performance at events like the Olympics might drive them to increase training to harmful levels.

Lot of sports people . . . they're channelled into that at a very, very early age and particularly in Australia; it's a real sports culture. Australia is actually measured by its sport and its success, its cricket teams, football teams, everything. It's the fact that it gets, budgets for X number of Olympic golds, you know and actually makes budgets for it.

Particularly in this country, we have got more and more and more of the country's morale being measured on its success in sport, and when that occurs you know everyone is competing to have the Olympics and there's always competition going on.

I know that coaches feel, "You've got to do it" especially in Australia, you know I think they bang their chests a bit more here and their ego is out there a bit more, but they're really passionate about it and that's why they're good at sport, but they do push people harder.

There are publicly, socially desirable goals. So, we make this assumption that everyone has the same goals. So, if you have a bunch of elite athletes together, you would assume that everyone's aspirations there are to become Olympic gold medallists. If you are on the Australian swim team, and you are not going to be going out for Olympic gold medals, what are you doing here?

Summary of socio-cultural factors. People are influenced by social norms, traditions, and expectations, and may be affected by the slogans that are repeatedly highlighted in the popular media. The experts identified several socio-cultural factors that affect athletes and motivate them to increase training to excessive levels. In particular, one expert noted that sport cultures that allow abusive dynamics between coaches and athletes might lead athletes to excessive training in attempts to please the coach. Experts also commented that closed sport cultures, where parents do not intervene, or where abusive coaching practices are normalised, can contribute to athletes' overtraining. On a more general level, some experts suggested that societal endorsements for the *more is better* mantra could increase pressure for athletes to train harder. Similarly, media collusion in supporting overtraining behaviours, by worshipping the injured competitor might motivate athletes to push through injury. One expert pointed out that the political structure of sport in some countries provides substantial socio-economic reward for athletes' families when the athletes are successful, and, thus, increases the pressures on the athletes to overtrain. Finally, experts commented that athletes might be motivated to increase training within countries where sport has become a significant part of the national identity and athletic achievement has been associated with national pride.

General Dimension 3: Situations, Factors, or People that Affect Athletes' Needs for Recovery

Looking at the people and circumstances surrounding athletes that might influence their OT behaviours, experts offered several opinions that related to General Dimension 3, situations, factors, and people that affect athletes' needs for recovery. In analysing the experts' comments about risk factors for OT, I feel that this dimension pulls together many of the factors that could conceivably add to the total stress load, from which athletes need recovery. General Dimension 3 is distinguished from General Dimension 2 in that it represents all of the situational OT risk factors that are not involved with motivating the athlete to do extra training, but which might create extra stress, nonetheless, and, subsequently, increase the need for recovery. General Dimension 3 comprises four major categories, which are a) Behaviours and attitudes of coaches, b) Behaviours and attitudes of family and others, c) Specific sport factors, and f) Other life factors that affect athletes' needs for recovery. The major categories of General Dimension 3 are addressed in the following sections.

Behaviours and Attitudes of Coaches

This major category includes descriptions of behaviours and attitudes of coaches that might create situations demanding extra recovery, or situations that do not allow for individual recovery needs of athletes. In General Dimension 2, I identified attitudes and behaviours of coaches that might motivate or pressure athletes to increase training to excessive levels, whereas, here within General Dimension 3, I have included behaviours and attitudes of coaches that directly, or indirectly, increase demand for recovery, without the athlete feeling pressured to do extra training. Within this major category, there were two subcategories, comprised of the following: a) Factors related to lack of knowledge, understanding, or awareness, and b) Factors related to health issues.

Factors related to lack of knowledge, understanding, or awareness. The coach is often the most influential person in how athletes approach their training and recovery. Experts pointed out, however, that when coaches have shortcomings in knowledge, understanding, or awareness of risky situations, the risk to overtrain athletes, due to insufficient recovery, can increase. Experts commented that some coaches do not understand or acknowledge the significance of psychological or other stressors in the recovery processes, which might lead to the coach to neglect individual athlete needs.

Some coaches just don't read athletes well and don't want to know about that sort of personal side, outside of sport. All they're looking at is the performance side of it and the need to get the kilometres under the belt and do the work and get it right. Coaches need to look at those other sides of the athlete.

I think there's a lot of breakdown, mentally, in athletes. I don't think the coaches understand that very well, whereas, I want to work with the personality more. I think that's just as important actually, keeping athletes' minds. . . stable. . . just to make sure that they're not stressed and they're feeling comfortable.

One expert related an anecdote where the coach lacked leadership or initiative to alter the training program, to reduce the load and increase recovery, of an athlete who was overtraining.

At the stage when this athlete was inflicted with this complex syndrome thing, he was a mature age swimmer. He was well into his 20's, mature age swimmer, and I think it was difficult for the coach actually to take over, or maybe the coach just didn't want to take over and give the athlete the guidance he needed. I think sometimes those athletes need to be lead, rather than just be advised.

In other cases, several experts pointed out that coaches might not have enough sport science knowledge to make good decisions about training and recovery. This lack of knowledge seems to be a significant risk factor that can interfere with planning adequate recovery.

I don't think all coaches know enough about tapering. I still think there are some coaches, even in this environment, this sort of national level environment who believe that you should be pushing hard right up to the end of the performance, the harder you push, the better you'll perform. Athletes need that recovery from a taper.

Clever footy coach, right? If they get a player to a peak, they tend not to push them that hard. They know how to plateau the training right, but other coaches don't and, I mean, the point is, let's face it, many coaches are totally ignoramuses. Many coaches are ex-athletes who, you know, they've done it that way and that's the way it's going to be done and (a) they don't know how to communicate, and (b) they don't really understand physiology.

A coach who is not that interested in really smart stuff will put his athletes at risk, and the smart stuff is knowing the whole base of the pyramid and being prepared to plan it out.

More is not better. . . but it takes good coaching and good education, like teaching you how to put it into practice, which means understanding fatigue. What is the level of fatigue? Are you talking about just being tired and then 10 minutes later you feel OK, or tired and 20 minutes later your heart rate is still up? Coaches need to learn this stuff.

Finally, many experts noted that accounting for individual differences between athletes is critical to tailoring a program to the training and recovery needs of each athlete. The experts pointed out that coaches, who are not aware of, or do not consider, individual differences in physical or psychological resources and capabilities, might be more likely to design training programs that put excessive demands on individual athletes' needs for recovery.

So when you put everyone in the team together, the great coaches now allow for the personality types... you know, "This travel has been stressful for you and I am going to let you have a day off tomorrow. In fact, I want you to do your ride on your own too." Or, "You three need excitement. We are going to go see stuff. We are going to go on a big ride through three little towns and in one of them we are going to jump off our bikes, put our tennis shoes on, do a little circuit. You need something to think about, and when we get back I want you guys to get right on your studies because you guys are all doing your correspondence studies." The not so good coaches just won't do this stuff.

If you've got a weaker rower or this rower doesn't respond to the same volume as those guys, or he's a predisposed fast-twitch athlete and what he needs is slow-twitch adaptation, and then you've got another rower in there who's total endurance, you know he can go all day, but he can't go fast, those two athletes, if they're going to row in the same boat, they need to change, make adaptations, to come closer together. You can't just give them all the same training program.

Hardly, if ever, do you get everybody into the same training program on the same day, on the same page. "We are all committed. We are all ready to go." Everybody comes in from various levels of fitness, various levels of injury, various levels of motivation. They all come in from different places. And a coach tends to treat them

all the same. “This is Monday's training program and we are all doing the same. We are doing the same distance, the same intensity, the same heart rate.” . . . This herd mentality is problematic.

Every athlete responds individually to training stimulus, training volume, training intensity. . . . I think it's most important the coaches respect and understand, and are constantly aware of, the individuality of each person, their physiological individuality, because, as I said, at that level there really is a predisposition to commercialisation of coaching and it all becomes generic and pro-forma. Here's your training program, this is the program that I have. . . . That means that there can be a risk that very little care is given to individualising the program and monitoring the individual responses to the program. . . . How many coaches really sit down with their athletes and work out their individual needs?

Factors related to health issues. How coaches respond to different issues related to an athlete's health can have an impact on the athlete's training and recovery behaviours. Experts commented that athletes might struggle to get adequate recovery in circumstances where coaches reinforce silence regarding injury, illness, or fatigue issues, or where coaches push for early return from illness or injury.

A lot of coaches make the athlete feel guilty for saying . . . they should cut down because they are starting to feel excessive fatigue or a niggling injury . . . or even for thinking something like that.

Let's say they're injured, there is a huge amount of pressure from the coach, and the coaching staff, for a doctor to declare a player ready before they would technically be even ready.

If medical staff say they're clear physically to play, they'll play and you try and tell the coach that this athlete has not mentally had a good rehabilitation from this injury, they'll go “they're soft”.

Summary of behaviours and attitudes of coaches. According to the experts, athletes might be at increased risk for overtraining when their coaches lack knowledge, leadership, or awareness of significant areas associated with recovery, or when the coaches behave in ways that might affect athletes' recovery needs. In particular, coaches might not have sufficient knowledge about, or awareness for, psychological or other stressors, principles of sport science, or individual differences between athletes. Coaches might also lack the leadership to alter athletes' programs, even if it would be the best course of action, or

coaches might reinforce silence regarding injury, illness, or fatigue issues, and push for early return from illness or injury.

Behaviours and Attitudes of Family and Others

Similar to coaches, the behaviours and attitudes of family members, and other people around the athletes, such as athletic support staff, can create situations that might increase, or in some cases interfere with, athletes' recovery needs. Within this Major Category, there were two subcategories, comprised of the following: a) Attitudes toward life balance and other stressors, and b) Factors related to health issues.

Attitudes toward life balance and other stressors. Athletes might often be perceived as highly functioning individuals, capable of performing in many areas of their lives, and able to handle most stressors. Experts pointed out, however, that when athletes are in environments where people around them, in particular, physiologists and other athletic support staff, do not pay attention to the impact of stressors outside of sport, the athletes might be at greater risk for overtraining from underestimations of their needs for recovery.

Physiologists aren't going to stop and evaluate your stress at home. Don't care. Assume everything is fine at home. "Lets take some blood parameters. Throw you some quick numbers." And they can bullshit diagnosis and walk out of there. . . . I think a lot of time we overgeneralise the physiological response. We do not take into account the psychological response.

So, it comes down to the same thing; we [the athletic support staff] tend to treat athletes like robots. We tend to think that at any given time they will give 100 percent effort upon demand and, therefore, the only thing that prevents that from happening is physiology, is conditioning. It is often assumed that if they do not perform the way we have requested them to perform, it has nothing to do with motivational levels and psychological stressors, it has everything to do with physiological levels. I just think that that is a very naive approach to training elite athletes. . . . People need to consider those other things in athletes' lives.

We tend to think about overtraining in relationship to, "OK. We have overcooked them." That is usually what coaches will say, "God. I should not have done that." . . . That usually comes from the physiologist looking at every poor performance as being a physiological issue and they typically refer to it as adaptation, "OK. They are going through an adaptation." And I argue, "Do you know everything that is going on with the athlete?" . . . So, unless you take a holistic picture of what is

happening, if we try to fit everything through a physiological, medical model, we will not be getting an accurate picture.

Factors related to health issues. Similar to coaches, how family and others respond to athletes' health issues can have an impact on overtraining behaviours. One expert noted that sometimes parents ignore or deny consequences of setbacks, such as injury or illness.

Well I think the important thing is that you don't ignore signals. For example, I sometimes get parents . . . sitting here and their kids might have some form of stress fracture in the spine and you can see it on x-ray, or CAT scan, or MRI, or bone scan, and the parent says, "Oh, but she's so good and she's won the triple jump and the high jump and she's a sprinter and she's so fantastic and she's come first in the school. She's in the Victorian; she could be in the Nationals." In the meantime, I'm trying to tell this kid that they've got basically to stop for a season. Now this kid is sitting there and the mother says, "Oh, but she really loves it so much. She just absolutely loves the sport." And I'm sitting there thinking, "Well, OK, she loves it, but she's going to be stopping for a year. Do you have to go on this long? Who is loving it more, you or your daughter?" Of course the father with the son says the same sort of thing. So you get a lot of this pressure from parents for their offspring to be different, to be better, to excel. . . . It gets in the way of making good decisions for those athletes.

Another expert commented that sometimes the medical staff can feel compelled to push athletes to return early from injury or illness.

The pressure comes back on your sports medical staff. They know how important this player is to the team, and they've been involved with the team for so long, and they know in their mind when this player doesn't play we tend to lose. So, they can compromise. Normally they may have declared, "Not ready to play." Now, they may say, "You are ready to play." And the pressure on the medical staff is enormous to do that.

Summary of behaviours and attitudes of family and others. Aside from coaches, several others in athletes' lives, including parents, medical staff, and others, such as sport physiologists, can influence athletes' overtraining, when they behave in ways that affect athletes' needs for recovery. Experts noted that athletes might be at greater risk for overtraining when others do not pay attention to the impacts of athletes' stressors outside of the sport, ignore or deny consequences of setbacks, such as injury or illness, or feel compelled to push athletes to return early from injury or illness.

Specific Sport Factors

This major category includes descriptions of the factors directly related to the athletes' sports that might affect athletes' needs for recovery. Within this major category, there were four subcategories, comprised of the following: a) Training program factors, b) Pressures from financial strain or lack of resources, c) Transitional factors, and d) Other sport-related factors.

Training program factors. Within sport specific factors, the design of the training program, conceivably, is one of the most important variables affecting athletes' training and recovery balances. Experts made several comments about different aspects of training programs that could affect athletes' needs for recovery. Several experts voiced concerns about athletes following overly repetitive, high-volume schedules and training activities. Ostensibly, high volume, repetitive training can create situations for athletes, where they work a particular body part or energy system so intensely that they do not give it enough time to recover for subsequent training sessions. Furthermore, the repetitiveness of a training stimulus might also increase psychological fatigue, from which athletes need extra recovery.

I just asked about the base period, I said "Do any riders have programs where they just do volume?" There were a couple of riders there who have coaches who go through periods of training where they do nothing but volume. It's, "Go out and ride and what we want to do is do as much riding as you possibly can," and I, personally, have a great problem with that. . . . Then I posed the question to them, I said, "Oh well, that's interesting to me. Now we'll look at the pre-competition period, and the competition phase. How many of you do long endurance rides in this part of the year?" Every one of them did. It gets to be too much, too much volume all the time. It's problematic.

Just the training program, maintaining variety in the training program; I can't understand the training program that doesn't have all training factors, at all times, obviously, in balance. . . . It needs to be varied. . . . Don't work the same way every single day. There's variation in terms of speed, aerobic work, skill work, that type of thing, and obviously covering the various energy systems, but not overdoing any particular one, rather using all of them.

He just kept flogging them, and flogging them, and flogging them, and it's that type of training that is going to wear people down, same old, same old, every single session, every single day, and it being too hard as well. I think, while people need to train hard, they need to train fast and it needs to be fun. . . . I think it's probably harder to swim easier, than it is to swim harder.

Sports like cycling, swimming, or running, just go out and ride, swim, or run, basically the same thing every day, just go hard every single day. If you just ask people what is their typical training schedule and they say, "Oh. I train every day." "So, what do you do?" "Oh I do an hour, then two hours." "What kind of pace?" "Oh. I just run fast or just ride hard." You can see that there is no sense of balance, no hard-easy balance. . . . Repetitive training. Injuries and overtraining come from doing the same things over and over again, and this is where you see problems coming up

Similar to repetitive training, experts suggested that overemphasis on one area of training, to the exclusion of other important areas, can increase risk for OT. It seems that such specific focus can create imbalances in the body, increasing demands for recovery for the parts of the body or energy systems involved.

It's so easy to sit there and just do it, flog yourself on one thing... rather than doing a proper program. Combining strength with conditioning, so you don't get, for example, lopsided towards conditioning stuff, doing the strength, conditioning, and skill stuff in balance. . . . You look at an athlete. . . who comes with these, these massive quads and pathetic little hamstrings, there is complete imbalance in the body.

You just go into the gym and you do what's your favourite thing. You don't say, "OK, what's going to help me achieve?" That's where the good coach has to come in, and where the sports scientists have to inform the coaches, so that they can then analyse their players or their performers and say, "OK, you are deficient at this, so we need to spend more time on that. I know you hate it and I know you just want to go and do bench press, but you can't because you don't need it." So, that's smart training. That will reduce injuries. . . . If you push too hard in any particular area, then they're going to get fatigued, you're going to break down and you are going to get ill.

One expert noted that some athletes will be at risk for OT because they have too many, non-coordinated inputs regarding their training needs, which probably leads the athletes and/or their coaches to underestimate recovery needs.

We have had a lot of problems with some of the Olympic programs. Athletes will be part of a national squad or be given a program down from the national squad, but they are also working with the home coach and maybe a personal trainer. The home coach is creating their own program, the national program has some program,

and then their personal trainer has their own program. The athlete thinks, “Well, I’m putting them all together, because that’ll be a lot better than one.” It’s not coordinated. . . . It’s really, really difficult to get coaches to understand that athletes are doing things at other times.

Another expert suggested that there might be less chance for recovery and greater risk or for OT in multi-discipline sports training programs, where there might not be enough consideration for how each of the different disciplines increases needs for recovery independent of the others.

Well I think the classic is . . . I have worked with some triathletes who have gotten themselves to the point of some sort of fatigue syndrome, completely just broken down. In those cases . . . the classic thing is, if you’re out training and you are doing an entire swimming program, doing an entire running program, doing an entire biking program, its getting caught up in going around and doing everything with others in single discipline sports. They’re out riding with the cyclists, and then they go to the pool and they’re swimming with the swimmers, and then they go and catch up with some of the distance runners and do their running. The problem is that they are catching up with people who are doing that as their only sport. Now they may not, they’re probably not doing every session, but they are still doing things that are of high intensity and volume of single discipline sessions.

Finally, one expert commented that training program design aimed at maintaining constant peaks in performance is quite likely to produce negative outcomes, such as injury and illness, because such programs do not allow enough time for recovery.

Well if you look at the concept of periodisation, of training and peaking, as we said before, you can’t be peaking for 12 months of the year can you? If you try, you are not going to succeed because you will end up burning out, getting tired or sick, or injured. Basically, peaking just means that you are working so hard and so intensely and you’re so focussed that something is going to give.

Pressures from financial strain or lack of resources. For athletes in many sports, the costs related to the sport, such as for training, travelling, or equipment, require athletes to take on extra stressors outside of their training environment, for which they need recovery. Experts commented that some athletes may take on additional work to meet the financial demands of their sports; whereas, other athletes might simply feel the extra stress that being under financial pressure exerts on them.

Some athletes have a lot of overheads. I wouldn't exclude that out of the situational factors too, you know, financial issues. Some athletes have a lot of overheads to keep participating in their sport. They have to work in addition to training sometimes, and they have to do well if they're existence depends on it.

You know there's a lot of our lesser sports that if you make the national team, you still have to fund a certain amount of your trip, so that's where burn out is not just physical. When they start doing 25 appearances a week, they sacrifice some of their physical training. They are overloading, like they are not getting in until 11 o'clock at night because they are doing corporate talks to try and get money to fund their trip. Overtraining is not just you know, how many times you are running laps.

One expert pointed out that some athletes miss out on important support services and resources because the athletes cannot afford the services.

Support services are available, sports nutrition, physiology, psychology stuff, but it is a cost factor. They [athletes] cannot afford it. . . . I mean we can't all work for free. So, a lot of the time it will be funding or financial resources that will prevent them from having access to those services, and they might suffer because of it.

Transitional factors. Whenever athletes go through any type of transition, they will likely have to go through some adaptations to the new circumstances. In sports, there are numerous types of transitions that might increase the stress loads on athletes, for which they need extra recovery. Several experts pointed out that when athletes make transitions to new environments, such as when leaving home, changing competition levels, or joining new teams, they may experience additional stress, on top of what is coming from the training program.

That's a mental stress . . . moving to a big team environment instead of just going around in a small group. I've got a small group of say three or four, then suddenly you're in a mass group of 70 people and you've all got to go to the same thing and move around and people lose their freedom a bit. I think there's a bit more stress. They've got to do things that they are not always used to doing and then there's a tendency for them to break down.

The classic one that always comes to my mind with these sorts of things is when people change environments, new team, new job, move house, or go from school to university, or university to employment. Those sorts of things that they see as an exciting step in their life, you know, they see it very much as a positive stress, or more they see it as a positive event, but they don't recognise that it's also a stress, even though it's in a positive sort of sense. I think that's an enormous factor.

Well I go back to that previous example with this particular coach and he said this is the problem we see with all the [institute athletes]. They need someone to ring them to get them out of bed. They get into that habit, and they get looked after to such a degree that, once they come out of that environment, you've just got to spend half your time getting them organised. They aren't prepared for the stress of doing everything for themselves.

An athlete who came to train in the elite system and . . . came from this happy family . . . comes from an isolated country area, so, not a lot of experience about the world or about how things are. She is extremely talented in her sport and gets picked up into the elite training program. She comes with this expectation of what sport has been like back in her little home town . . . she is now faced with harsh expectations . . . stress and an extremely emotionally abusive coach.

Some experts noted that alterations in the physical environment, such as when changing time zones, going to altitude, or facing seasonal and/or climatic changes, can put extra stress on athletes' recovery processes.

Every time we go to altitude people get sick, but what is probably making them sick is the airplane flight because every time you go to altitude you have a big international flight following a big race. That is how everyone gets to camp. Going to altitude is probably not making them sick. It is probably going into international flights after two-week stage races that is making them sick. So why don't we try not getting scared of altitude. Let's try giving them three-day windows after races at the venue we finish at for relaxing, lying by the pool, go for a walk, watch some movies and hanging there instead of forcing ourselves onto a plane, which totally messes up their recovery.

I think the things we have to really watch is when they're tired and when the weather changes here in Australia, particularly in Canberra and it gets cold then, that's when they usually get ill.

One expert reminded me that one cannot look past the obvious: when moving up to high volume training phases, athletes will have to look at ways to increase their recovery activities.

Certainly you need to look at the sport itself and phases of training. I mean it's obvious that there are some phases of training that are high volume phases, where immune systems are likely to be compromised and psychological balance is likely to be compromised more. Just through fatigue, the endless grind. . . . They need more rest.

Another expert pointed out that with transitions into taper phases before big competitions, which are all about reducing training stress loads, one must also be aware

that there are increases in psychological stress, which can also affect recovery.

You usually find that coming into a taper period when the training volume drops, if you're not careful, that's when they get ill also. That's something to do with the immune system. . . . I find that that's when they tend to break down. When there's too much stress on them, mentally, and coming into the main meets, a lot of the top athletes break down, but I think that's more mental stress, and being in a big team environment.

Other sport-related factors. Aside from training program factors, pressures from financial strain, and transitional factors, there were a number of other sport specific factors that experts' identified as potentially adding to athletes' stress loads, which would need to be factored into athletes' recovery needs. Experts suggested that lengthy competitive seasons and/or high frequency of competitions, such as seen in professional sports, create situations that can be extra stressful for the athletes.

The way the AFL is going, with a pre-season, starting earlier and earlier. Pre-season started 6 weeks ago for the AFL in the Ansett Cup. . . . It's still summer out there and that will go on right the way through to the end of September. We've got a couple of [AFL] players here at the clinic and they get a couple of weeks holiday, then they're practically into pre-season immediately after that, like November/December and they're starting to train already. It's a full year. There's hardly a seasonal thing . . . very hard on the body.

The two best girls had been part of different teams in Europe and just had so many competition days that year, they just could not handle it.

Experts also reminded me of another, seemingly obvious, point: sports, typically associated with very high volumes of training will, inherently, increase the risk for overtraining by increasing athletes' recovery needs beyond their capacities to recover.

There are some high-risk sports, lots of injury. There are some sports, the longer, greater volume sports that are high risk for illness, overtraining, injury. . . . Athletes just don't have enough time to rest in these sports.

One expert commented that such high-volume sports might obscure the overtraining mentality of some athletes because the athletes' overtraining pathologies can be hidden by the sports' training demands.

Body heavy sports like rowing, triathlon, and cycling may attract people who are working out their [psychological] stuff through extreme bodywork. So then,

because those sports are so heavy on the body anyway, that line between what is training and what is overtraining, you know, because they're always pushing at the elite level, that becomes very tricky, and I think that's a bit of a risk factor.

Summary of specific sport factors. There appear to be a number of specific factors, which increase the risk for OT, that are directly associated with the sports in which athletes are competing. These factors might be seen to increase the overall stress loads of athletes, thus demanding increases in recovery time. Experts discussed the training program or schedule as being a particularly important element to consider in relation to overtraining. With respect to the training program, experts noted that the following factors might increase athletes' needs for recovery: overly repetitive, high-volume schedules and training activities, programs with over-emphases on one area of training, programs with too many, non-coordinated inputs regarding athletes' training and recovery needs, non-individualised training programs, multi-discipline sports training programs, and training programs aimed at maintaining constant peaks in performance. Experts also commented that there might be specific financial demands within the sports that increase athletes' stress loads. Experts claimed that some athletes will take on additional work, so that they can continue competing in their sports; whereas, other athletes might miss out on important support services because they lack the funding to afford the services. In addition to program and financial stressors, experts also identified periods of transitions as significant factors that can affect athletes' recovery needs. Athletes might be under increased stress when leaving home, changing competition levels, or joining new teams. Athletes might also need more recovery when faced with alterations in the physical environment, such as when changing time zones, going to altitude, or facing seasonal and/or climatic changes. Many athletes might experience increased stress from moving into high volume training phases, or when making the transition into taper phases before big competitions. Finally, according to the experts, athletes might experience increased needs for recovery when they are involved in

sports with lengthy competitive seasons and/or high frequency of competitions, or in sports typically associated with very high volumes of training.

Other Life Factors that Affect Athletes' Needs for Recovery

This major category includes descriptions of the remaining factors that can affect athletes' recovery, but which do not fit into the earlier major categories. There is no subcategory here; nonetheless, these factors might be described as more general activities or commitments outside of the sports training environment that demand time and/or emotional resources. For example, a number of experts suggested that school, university, or study commitments can increase athletes' stress loads.

A common group we see where overtraining can be a problem is the kids who are doing year 11 at school, because they're high-achieving kids. So they've got their study and their music and they're in the school play and the school rowing crew. So they'd get up at five to go rowing and on Tuesdays and Fridays they've got swimming as well.

I think the stress of university, and having assessment at university, and work, and just trying to do it all was just too much for this person. I think he just couldn't relax. There was no down time to relax. Whereas you see some people that get fatigued, they are able to pull away from some of their activities and just stop. These people, the ones that overtrain, the mind just ticks and that's just not letting them recover.

A few experts noted that general life stressors, especially for mature athletes, should be taken into account when assessing athletes' risks for overtraining, and their needs for recovery.

What happens of course is that you end up all of a sudden you've got a car and you might need to take a bank loan. . . . Then the next thing is you go and live on your own and then you've got to look after the house. Then the next thing is you have a relationship. . . . Then you've got to still do some study because you are going to earn a living. . . . What is that you end up having no time for yourself, no time to unwind, relax, and rest. I think a lot of these overtraining syndromes in the more mature athlete are just that living thing.

There is certainly a pretty important issue and that is that it is not just distress that comes about with training, but it is the other life stressors combined with the training. When people come to the Institute, their meals are made, their beds are made, and their laundry is done. They eat, sleep, train and there is nothing else to do. When you have got a job you are trying to hold down, kids you are trying to

take care of, stressful situation with a relationship, moving house, those things make it a lot more problematic. I think they can really compound the stresses that go on.

Finally, some experts suggested that publicity/media commitments, often associated with being a high profile athlete, can increase stress loads and/or interfere with recovery.

Their success creates problems for them because they become over-committed outside of their pure athletic endeavours. So then, all of a sudden, you know because they're famous, they have got to do the shopping centre appearances, the TV programs, and all those sorts of things. So that creates problems for them, because it then starts to interfere with their training regime and then their performance is going to drop off.

Now I've got some contacts with that club and I heard that what's happened to him is that he had all these media commitments. So all the time he was needing to do this, cut this ribbon, go to this, sign this, promote this, because of course he got a manager, didn't he? So what's the manager making money out of? Whatever he makes. So he had a shitty year, totally right, and one of the reasons is he just didn't have any rest.

Summary of other life factors that affect athletes' needs for recovery. Although it may seem obvious that factors outside of the sports environment might affect athletes' recovery activities and needs, experts suggested that sometimes the obvious risk factors get overlooked. Experts noted that school, university, or study commitments, general life stressors, especially for mature athletes, and publicity/media commitments, often associated with being a high profile athlete, are all important to consider in assessing athletes' risks for overtraining, particularly in relation to their needs for recovery.

Other Significant Results Emerging from the Expert Interviews

Although the purpose of the interviews with the experts was to discuss what they saw as risk factors for OT, many of the experts also made noteworthy comments related to both identifying and preventing OT. In the following sections, I have briefly summarised the main themes that arose with respect to identification and prevention of OT.

Identifying Overtraining

Experts suggested that there are a number of potential markers one can observe in athletes, which indicate that they might be engaging in OT behaviours, doing things that affect their needs for recovery, going through experiences that might predispose them to OT, or developing imbalances between their stress and recovery states. In particular, experts pointed out that one can gather information on markers of OT by examining athletes' behaviours, monitoring certain physiological parameters, and observing emotional states. Table 4 shows examples of potential markers of OT, derived from the interviews.

Table 4.

Markers of OT

<i>OT Markers</i>
<p>Observing Athlete Behaviours</p> <p>Changes in any aspects of athlete's routine Desperately sampling every potential supplement to gain advantage Sudden performance decrements or unexpected under-performance Reports from others close to the athlete regarding overtraining types of behaviours</p>
<p>Monitoring Physiological Parameters</p> <p>Poor sleep quantity or quality Changes in typical physiological parameters Weight loss or weight gain Evidence of minor injuries and prolonged fatigue Biomechanical or technique changes and/or faults</p>
<p>Observing Emotional States</p> <p>Appears emotionally distressed or emotionally reactive Expresses fears of failure Expresses guilt about missed or reduced training Expresses fears of communicating to coach or others about fatigue, injury, illness, or other stressors</p>

According to the experts, in monitoring for OT, it is important to pay attention to abnormalities in athletes' behaviours, physical responses, and emotional states. It is not so much about identifying an unequivocal marker of OT; rather, it is about monitoring for possible warning signs and investigating further when unusual patterns show up.

Observing Athlete Behaviours

Looking at athlete behaviours, one expert commented that he is concerned about OT issues when athletes are doing something out of the ordinary, something different from their normal routines. The expert suggested that this might be observed when athletes change established behaviour patterns, such as how they conduct themselves at training or how they interact with other people. One expert remarked that he saw an athlete desperately trying to gain every advantage by using nutritional supplements. Although looking for ways to gain advantages in training and recovery does not necessarily lead to OT, the expert pointed out that it was a sudden new interest in nutrition, and an obsessive pursuit of the *perfect* supplements, that alerted him to the athlete's OT mindset. Another expert emphasised the significance of looking at the patterns in performance fluctuation. Many athletes going through hard training may expect some normal performance decrements, or plateaus, but the expert suggested that, in assessing OT, one should look for any changes in performance parameters that are not expected. Decreased performance might be considered a marker of OT, when the performance drop is beyond reasonable expectations, given the current training load. Furthermore, with respect to performance, other experts commented that suppression of performance for sustained periods of time, longer than would be expected, is a possible indicator of OT. Finally, an expert commented that one might listen to the *shop talk*, that is what other athletes are saying about each other, to get an idea of who might be at increased risk of OT. The expert gave an example

of athletes talking to him about a team-mate, wherein the team-mate had been seen doing extra weightlifting outside the coach's program, while not telling the coach about it.

Monitoring Physiological Parameters

Looking at physiological markers of OT, experts suggested monitoring for changes in sleep patterns, elevations in resting heart rate, occurrences of minor injuries, unexpected changes in biomechanics or technique, unexplained weight gain or loss, and prolonged bouts of fatigue. Once again, the experts emphasised that one cannot make conclusive statements about OT based on a change or disruption in a single parameter, but one could follow up any anomalies with further investigation. One expert pointed out that regularly monitoring individual athletes on a selection of physiological assessment markers might be helpful in determining disruptions in normal patterns, which could be indicative of OT.

Observing Emotional States

Although emotional markers of OT are more difficult to detect than physiological ones, several experts pointed out that such markers might be strong indicators that athletes are be in a state of conflict, and potentially OT. The experts commented that heightened emotional responses by athletes might be associated with poor decision making about training and recovery. For example, a distressed athlete, feeling guilty about missed training due to injury or illness, might have decided to increase her training efforts to appease her guilt and reduce her anxiety; paying attention to an athlete's emotional reactivity when it first arises could lead a coach or supportive other to intervene before the athlete gets into trouble. One expert commented that he looks for what he calls *job satisfaction* in determining possibility of OT. When he sees a loss of motivation, he is alerted to the change, sensing that something is going on, which could turn out to be an imbalance between stress and recovery.

Summary of OT Markers

Generally, in assessing markers of OT, experts suggested that one take into account all aspects of the athletes' lives, including changes in training environments, training partners, training regimens, and other lifestyle factors. The experts suggested gathering as much information about an athlete as possible to make a reliable assessment about OT.

Preventing Overtraining

Without asking, most of the experts offered me ideas on what coaches, athletes, and others could do to prevent, or at least minimise the occurrence of OT. The main thrust of the suggested preventive measures seemed to be related to coaches' characteristics and behaviours, which might not be surprising given the substantial role that coaches play in many aspects of the athletes' lives. Experts also pointed out preventive measures for athletes and for significant others surrounding the athletes. The tactics for preventing or minimising OT, identified by the experts, could be divided into three main categories: engaging in preventive actions and behaviours, improving education and awareness, and enhancing communication. Examples of preventive tactics are summarised in Table 5.

Table 5.

Tactics for Preventing or Minimising OT

<i>Tactics</i>
Engaging in Preventive Actions and Behaviours
Take initiative to reduce training, if necessary
Monitor athletes' feelings regarding performance
Monitor and assess athletes' beliefs about training and recovery
Try to pick up on signals, physical and psychological regarding fatigue and recovery
Design training programs according to individual athlete needs
Monitor stressors in athletes' lives, both inside and outside of sport
Try not to sustain, unrealistically, an athlete's peak in performance
Improving Education and Awareness
Help athletes to develop awareness for different levels of fatigue
Develop awareness of one's limitations as a coach
Educate parents, coaches, and athletes regarding abuse and personal boundary issues
Educate athletes, coaches, parents, and others regarding recovery, and other issues related to a balanced approach to life
Educate athletes about individual differences in training and recovery capacities
Emphasise athlete life balance
Enhancing Communication
Communicate about the importance of rest & recovery
Emphasise open communication to and from athletes, especially regarding injury, fatigue, illness, and other life stressors

Engaging in Preventive Actions and Behaviours

With respect to preventive actions and behaviours, the experts suggested several general actions, which could be taken by a team or organization, described characteristics of proactive coaches, outlined a number of specific actions, which could be taken by coaches, and pointed out a few specific actions, which could be taken by athletes, to help reduce the occurrence of OT.

General actions for teams or organizations. At the team or organisational level, experts pointed out that processes could be put in place to regularly monitor athletes for

illness, injury, and performance capacity. Furthermore, experts commented that it could be helpful to have someone on the team dedicated to monitoring aspects of each athlete's health, and paying attention to issues in athletes' lives, outside sport. Experts also emphasised that a focus on recovery activities was important, and suggested specific recovery strategies, such as allowing athletes extra time to recover after competitions before going into any transitions, especially before long international flights.

Characteristics and behaviours of coaches. Experts outlined some of the characteristics of proactive coaches, those most likely to help minimise the occurrence of OT. The experts described such coaches as being astute, athlete-focussed, not totally preoccupied with their own agendas, and accepting of their own limitations as coaches, but prepared to take leadership roles with respect to adjusting training and recovery, when necessary. Experts also characterised such coaches as being communicative, open to change, flexible in their programming, and willing to make adjustments to suit athletes' individual training and recovery needs. Finally, the experts pointed out that proactive coaches are more likely to pay attention to subtle early warning signs of OT, such as slight, unexpected changes in athletes' performances or techniques, or unusual physiological and psychological responses within the training environment.

The experts also discussed preventive actions, which coaches could take, to minimise the occurrence of OT. Several experts recommended that, when designing training programs, coaches should take into consideration the individual capabilities and needs of each athlete, including an understanding of athletes' training habits and past training/injury histories. Experts suggested that coaches could become more educated about factors that affect fatigue, and become proactive in scheduling recovery strategies to counteract the fatigue. The experts commented that coaches could monitor athletes for the many signs of OT, and take initiative in reducing training loads before athletes suffer more

adverse outcomes. Giving a few specific examples of reducing training, prophylactically, experts suggested that coaches could choose to reduce the loading pattern after athletes experience peaks in performance, after extremely intense performances, or after slight decrements in performance. The experts also pointed out that coaches could reinforce the importance of recovery by championing the concept of rest, and explaining to athletes the significance of adequate recovery for optimal performance.

Athlete actions. The experts pointed out a number of things athletes could do or be encouraged to do to help minimise OT. Experts suggested athletes could develop increased sensitivities to their own limits with respect to stressors, coping, and recovery, learn to monitor their training and recovery responses, perhaps with a diary, and practice setting goals around balancing their training and recovery. In terms of balance, experts suggested athletes could engage in activities outside of their sports, such that they have something to fall back upon when their athletic careers end. Furthermore, athletes could try to avoid maladaptive behaviours, such as trying to make up for missed training. Finally, in the event of injury, experts suggested athletes need to find ways to stay active during the rehabilitation process, so that they fill the time normally dedicated to training, and reduce the likelihood of coming back too early.

Improving Education and Awareness

In trying to minimise OT, experts suggested that coaches, athletes, sports organizations, and parents could all take steps to improve education and awareness about factors related to OT. Experts emphasised the importance of teaching athletes and coaches about, and helping them to apply, sport science principles underlying athletic training. Experts suggested promoting a balanced approach to training and recovery for athletes, helping coaches and athletes to understand that more is not always better. Experts also pointed out that athletes, and those around them, could benefit from improved

understanding of, and awareness for, issues related to growth and development, strategies of recovery, and interrelationships among training, performance, and fatigue. Experts commented that it could be important to educate teams about individual differences in training and recovery capacities, so that the athletes could have a better understanding of why different team members might get different training programs. In describing OT as being associated with abuse (physical and emotional) directed at athletes, one expert suggested that coaches, administrators, staff, and parents could have more education about people dynamics, personal boundary issues, and risks for athlete abuse in sport. This expert noted that one might be cautious identifying individual athlete characteristics as risk factors for OT, to the exclusion of situational or systemic risk factors because such exclusiveness risks removing responsibility for OT from coaches and others, and placing it solely on the athlete.

Enhancing Communication

Almost all experts seemed to agree that better communication was an important element in minimising the risk for OT. Experts suggested that promoting two-way communication between coaches and athletes could help athletes to communicate honestly about levels of fatigue, potential niggles, or illnesses, and help coaches to make adaptive decisions about scheduling training and recovery. Furthermore, experts suggested holding forums of communication that promoted openness among all parties concerned with the athlete, including coaches, doctors, psychologists, physiologists, nutritionists, and parents. Finally, experts pointed out that positive, supportive communication established among athletes, coaches, and parents could be helpful, especially encouraging coaches to talk with parents about promoting balanced training, and not reinforcing maladaptive behaviours, such as training through injury.

Summary of OT Prevention

Generally, in preventing of minimising OT, experts suggested that athletes and all people involved in athletes' lives, such as coaches, parents, and administrators, could benefit from increased awareness, knowledge, and communication about OT risk factors. Furthermore, to minimise the occurrence of OT, experts recommended that all people involved take initiative to monitor athletes' recoveries and adjust training loads, accordingly.

Study 1 Discussion

General Comments

Upon finishing the analysis of Study 1, the expert interviews, I asked myself, What have I learned from doing in-depth interviews with sports experts about OT risk factors? My first reflection on what I have learned was that there is a multitude of personal and situational factors to consider when looking at athletes' risk for OT. The list of risk factors, as outlined in the inducted tree-diagram, is long, detailed, and complex; yet, perhaps, expectedly so. There is a lot of information regarding OT risk factors for any applied practitioner, coach, athlete, or family member, of which to be aware. Furthermore, human behaviour, which includes athlete behaviour, because of its complexity, is difficult to reduce to algorithms. People overtrain for different reasons: some athletes appear to be very driven from within, whereas others seem to be pressured by people and circumstances around them. All of the experts had stories to tell of athletes who had become overloaded, either from too much training stress or from other stressors in their lives, and had suffered adverse consequences because of the overloads.

In the following sections, I discuss the results of Study 1 in relation to the extant literature. First, I will discuss what the experts in Study 1 had to say about OT in relation to definitions, prevalence, variations in OT, and markers of OT. Second, I will compare the OT risk factors identified by the experts in Study 1 to risk factors identified by other experts/researchers in the field. I will discuss, methodological issues, implications for practice, including preventive measures, and future research directions in the general discussion chapter of this thesis.

Literature Review

Definitions of Overtraining

During the interviews with the experts in this thesis, I did not query the experts, specifically, about how they defined OT; rather, I observed the ways in which they referred to OT, in general. Overtraining was mostly referred to as a process that led to a number of different negative outcomes, including injury, OT syndrome, illness, and other clinical problems. Some experts seemed to equate burnout and overtraining, which might be expected because many athletes and coaches appear to use the term *burnout* to describe an overtrained state. The expert group did not make any references to other terms, such as staleness or overreaching, used by researchers and other experts in the field (e.g., Armstrong & VanHeest, 2002; Hooper & McKinnon, 1995). Furthermore, unlike Lehmann et al. (1999a), none of the experts in Study 1 made distinctions between short- or long-term OT. In summary, it seems that the ways in which a group of experts, working with elite level athletes in Australia, talked about overtraining, supported Kenttä and Hassmén's (2002) holistic descriptions of OT as a stress/recovery process with many causes and numerous outcomes. Overtraining, especially when understood in terms of a stress/recovery imbalance, includes behaviours and processes with various adverse outcomes, such as performance decrement, prolonged fatigue, illness, injury, and OT syndrome.

Prevalence

The past prevalence research on OT (e.g., Morgan et al., 1987) has been mostly directed at determining the rates of occurrence of *staleness*, a state usually equated with an outcome state of OT, called OT syndrome. The experts, here in Study 1, however, talked about OT as a process with multiple outcomes; none of these experts referred to OT as *staleness*. For my part, I did not explore expert opinions on OT prevalence, and I was not

out to establish statistical evidence of OT prevalence. Furthermore, given the criticisms of the prevalence research in the literature review, regarding problems with defining OT and asking clear questions about it, I did not think I was in a position to collect any reliable evidence about prevalence. Nonetheless, going on what the experts in Study 1 had said about OT processes and their varied outcomes, such as injury, illness, performance decrement, and prolonged fatigue, it might turn out that the prevalence of OT is higher than originally expected. If we look at OT processes in terms of significant stress/recovery imbalances with observable adverse outcomes, in contrast to looking at OT only as an excessive fatigue syndrome, which has been identified as a rare occurrence (e.g. Urhausen & Kindermann, 2002), we might find that it occurs in most athletes. The difficulties with detecting OT behaviour in the first place, lack of agreement over definitions, and use of retrospective recall in the prevalence research, however, leave most discussions of prevalence as speculative at this point.

Variations in Overtraining Processes and Outcomes

In terms of variations in OT processes and outcomes, the interviews with the experts provided support for the observations made by past researchers. In particular, echoing Steinacker and Lehmann (2002), who commented that, “many other clinical problems may arise as a result of overtraining” (p. 103), the experts in Study 1 identified illness, injury, and compromised health as being associated with OT. Both Flynn (1998) and Kibler and Chandler (1998) discussed the potential interaction between OT and musculoskeletal breakdown. Similarly, the experts in this thesis used several examples of athletes who suffered serious injury as a result of OT. In particular, one expert identified young athletes as being at high risk for musculoskeletal injuries from training too hard during spinal development or growth spurts. Furthermore, several of the expert group discussed how coaches, parents, and medical staff will encourage athletes to train with

niggles and injuries, conceivably creating greater stress/recovery imbalances, and putting the athletes at greater risk for more serious injuries. These types of attitudes and reinforcement behaviours by coaches, parents, and others could result in misattributions about the causes of injury, as suggested by Kibler and Chandler (1998), who commented that OT might be overlooked in analysing common sports injuries, when it may actually be a hidden contributor to the injury. With respect to illness, a number of past researchers have pointed out that OT has been associated with increases in head colds, allergic reactions, and upper respiratory tract infections (e.g., Armstrong & VanHeest, 2002; Niemen, 1998). Along the same lines, the experts in this thesis drew causal links between OT and compromised immune function.

Despite suggestions that OT can be broken down into sympathetic and parasympathetic classifications (Kellmann, 2002; Lehmann et al. 1998; Lehmann et al., 1993), the experts in this study did not point out any differences between types of OT according to these distinctions. I did not query the experts, however, about their views on the sympathetic and parasympathetic classifications of OT.

Bringing together the comments of researchers in the literature and the results of the expert interviews, it appears that there is agreement among experts, in general, that OT, illnesses, and injuries are often causally linked; illness and injury may be both results of, and contributors to, OT processes. It also seems that there is some agreement that neglecting these links might result in making mistakes when assessing the causes of injury or illness, potentially leading to misguided responses to those injuries and illnesses, such as when determining adjustments to future training and/or recovery activities.

Markers of Overtraining

With respect to markers of OT, I asked the experts in this thesis to discuss what they identified as *red flags*, things that would cause them to suspect OT. Although many of

the experts in Study 1 suggested keeping track of simple physiological parameters, such as resting heart rate and sleep patterns, in accordance with research findings of other experts (e.g., Uusitalo, 2001; Wall et al., 2003), they also identified some unique behavioural and emotional markers to be observed in athletes, who might be OT, such as expressions of guilt or fear about missed training, or unexplained emotional distress or reactivity. Among several experts there was an emphasis on using OT markers, not as conclusive evidence of OT, but as starting points to investigate the possibility of OT. This type of emphasis fits with the research findings (e.g., Armstrong & VanHeest, 2002; Urhausen & Kindermann, 2002), which have illustrated that there are no markers, physiological or psychological, which can clearly indicate a state of OT.

In terms of psychological markers of OT, the experts in Study 1 suggested paying attention to changes in behavioural and emotional states, noting that any changes, especially unexpected ones, could indicate that OT was a possible cause. As mentioned in the literature review, the Profile of Mood States (POMS) has been researched extensively as a potential marker of OT (e.g. Morgan et al., 1987; Halson et al., 2003; Hooper, Mackinnon, & Hanrahan, 1997; Pierce, 2002), but despite correlations between POMS scores and training volumes, POMS scores have not been found to correlate with performance, rendering the POMS measures as seemingly no more than indicators of intense training. Nonetheless, one might wonder whether this psychometric measure, which seems to correlate reliably with training volumes, might not have some utility in the context of assessing OT. Perhaps scores on POMS profiles could be useful in monitoring OT, if one uses them in the same manner as the experts in this thesis suggested using any other OT markers, simply as indicators that something is going on in athletes' lives that calls for further investigation. If there were a place for using the POMS in the context of OT, I think that it might be in looking at the changes in individual responses over time. I

am not convinced, however, given the criticisms of the validity of POMS subscales for measuring mood in athletes (see Martin et al., 1999), that one should continue to use this tool as a marker of OT. What might prove to be a more useful alternative to the POMS for assessing OT is the Recovery-Stress-Questionnaire for athletes (RESTQ-Sport; Kellmann & Kallus, 2001), especially given the Study 1 experts' emphasis on more holistic assessment; the RESTQ-Sport was constructed to measure a range of stress states and recovery activities from emotional, physical, and social perspectives.

Comparison of Perspectives on Overtraining Risk Factors

The results of Study 1 provide support for the anecdotal observations of other researchers in the field, identifying a broad array of personal and situational OT risk factors, as highlighted in the literature review of this thesis. Regarding the complexity of causal factors for OT, Gould and Dieffenbach (2002) stated,

It is evident that researchers must look beyond mere physical training as a cause of overtraining. . . . Other factors, such as psychological stress, inadequate rest, the type of recovery activity, travel, personality, and sociological issues, must be examined. (p. 33)

In this thesis, numerous experts in sport identified all of the variables, mentioned here by Kellmann, and more, as being associated with OT, showing that there are potentially many causes of overtraining beyond the physical training stimuli. The experts in this thesis indicated that not only are there many causes for overtraining, but also there are unique causes for each athlete. Emphasising this uniqueness, Lehmann et al. (1993) have stated, "Inter-individual differences in recovery potential, exercise capacity, non-training stressors, and stress tolerance may explain the different degrees of vulnerability experienced by athletes under identical training conditions" (p. 25). The evidence from the experts' interviews supports Lehmann et al.'s statement.

Comparing what the experts in this thesis have said about risk factors for OT to what other experts have observed and stated anecdotally, there appears to be substantial

overlap. For example, similar to Krane et al.'s (1997) description of overtraining in a gymnast with abusive coaches and pushy parents, the experts pointed out that athletes are at higher risk for overtraining when they are surrounded by people that reinforce excessive and physically-damaging training practices. Paralleling comments by numerous researchers (e.g., Brustad & Ritter-Taylor, 1997; Hanin, 2002), the experts also pointed out how coaches and others might endorse OT behaviours by trumpeting slogans, such as *no pain, no gain* and *more is better*, thus reinforcing culturally-driven, yet maladaptive, expectations of athletes. Hanin (2002) noted that such endorsements are reinforced by the values held by some sport cultures, subcultures, and athletes, where quantity (intensity and volume) is emphasised over quality, a point also highlighted in the expert interviews.

Fry et al. (1991) commented on the lack of recovery time in the training schedule as “the most important risk factor for overtraining” (p. 123). Similarly, Hanin (2002) described risk factors for OT in terms of barriers to effective recovery and rest, suggesting that athletes and coaches may underestimate the importance of systematically matching workload with adequate rest. In support of Fry et al. (1991) and Hanin (2002), an entire general dimension, dedicated to factors that affect athletes’ needs for recovery, emerged from the expert interviews. According to the experts in Study 1, many factors might increase athletes’ needs for recovery, most often through increasing the total stress loads on the athletes, from both training and non-training sources. For example, recovery might be impeded when coaches, family members, or others pressure the athletes to return early from injury or illness, or, recovery needs might not be met when athletes experience increased demands from outside the training environment, such as from study, work, or media/publicity commitments.

The experts in Study 1 also identified other specific OT issues related to stress loads and recovery that accord with what researchers in the field have said. The experts

echoed Botterill and Wilson's (2002) comments in pointing out the significance of heightened mental and emotional demands during the lead up to big competitions. Furthermore, the experts acknowledged, in concert with Kellmann (2002), that simple changes in the physical environment, such as when changing time zones and/or seasons, or when going to altitude, are important risk factors to consider in terms of how such changes can have profound impacts on athletes' recoveries.

Looking at the entire range of risk factors identified by experts, I have conducted a side-by-side comparison of identified risk factors for experts from this thesis and experts in the field (see Table 6).

Table 6.

Comparison of Identified OT Risk Factors

<i>Raw Data Themes from Expert Interviews</i>	<i>Identified Risk Factors from Literature</i>
Obsessive commitment to training	
Never satisfied with performance or training	
Devastated if everything is not just right	
Extremely strong work ethic	
Very high internal drive for success/high ego-involvement	Very high levels of motivation to achieve success; motivation to set a new standard (e.g., world record)
No other foci outside of sport	
Fear of failure/combined with the need to prove oneself	Fear of failure
Derives all self-worth from sport	
May have significant underlying psychological issues	Personality structure – ongoing personal or emotional problems
Younger athletes going through growth and development	Adolescent athletes during growth spurts; overloading developing bodies
Older athletes dealing with increased recovery needs	
Exposure to, and evidence of, infection or virus	Physical illness, allergies, disease, or infections
Nutrient deficiency	Poor or inadequate nutrition; possibly inadequate caloric intake (especially carbohydrates); potential nutrient – vitamin/mineral deficiency, iron deficiency, dehydration
Very low body fat	
Has a history of physical or emotional abuse	
Has a history of OT, health/illness issues, injury, and/or problems with sleep or other forms of recovery	Athletes with a substantial injury history or experiences with overtraining; emotional stress from major life events (e.g., illness, conflicts with partners, parents' divorce); poor or inadequate sleep
Has talent/potential at young age	Success – rapid rise in sport to the elite level (especially for young athletes); new PBs may cause athletes to believe that training harder will bring them even greater success
Accustomed to success in most areas of life	
Experiencing a peak in performance	Athletes at their physiological peaks are on the threshold of overtraining
Has been rewarded with success for pushing through pain or fatigue	

Table 6. (continued)

Has little experience with elite level training, and may rely heavily on others for guidance	Lack of objectivity when athlete is doing their own training, training without coach or partner
Lacks social and institutional support	
Athlete believes it is necessary to make up for any missed training or to get every single work out in without fail, regardless of the circumstances	
Believes in <i>more is better</i> approach or may express pride in doing extra	Fear of being under-trained – <i>more is better</i> philosophy
Lacks awareness or knowledge of sport science concepts regarding training and recovery	
Does not believe in recovery days and does not factor them into a training schedule	
Has unrealistic role models; compares self to others of different ability and even different physiology	Unrealistic role models - athletes may compare themselves to and try to keep up with faster, better skilled athletes – or comparison to successful others who train at high volumes, beyond the current capacity of the athlete; training with significantly more skilled or physically fit athletes
Has unrealistic goals regarding performance (may be evidenced with sudden increases in performance expectations)	Unrealistic goals set by athlete
Trying to drop drastic amounts of weight to make limits for weight class sport	
Disordered eating behaviours – trying to lose weight to satisfy body image issues or to gain a perceived advantage	
Experiences guilt about missed or reduced training and responds with doing extra	
Will do more training than what is scheduled by the coach, and may not communicate about the extra training	
Does not take enough recovery or comes back too early from injury or illness	Premature return from injury
Combining programs from multiple training sources to get the edge	
May be observed to do extra in most things outside of sport as well (e.g., work, school)	Difficulties with time management (practice/school/friends)
Coach is inexperienced/overenthusiastic	

Table 6. (continued)

Coach has experienced success with very high volume training or other risky practices, despite misinformed coaching practices or lack of knowledge	
Coach is highly acclaimed and has a large pool of athletes from which to select	
Coach is under financial/career pressures	
Coach is under high pressure to make self look good (especially high profile coaches, professional coaches)	
Coach maintains a <i>win at all costs</i> attitude	
Coach advocates very high volume training programs, based on <i>more is better</i> philosophy	
Coach has a short term focus on single performances or results	
Coach has an autocratic or non-communicative interpersonal style of coaching, especially problematic when combined with success	
Family and others reinforce <i>more is better</i> work ethic and other OT behaviours	
Family and others make approval contingent upon athlete's successes or do not provide praise at all	
Family and others that are very involved are totally success or achievement oriented	Excessive expectations from a coach or family; unrealistic goals from coach or parents
Family and others pursue financial gain from child's athletic success	
Parents have been or still are athletes and might live vicariously through child	
Family and others derive personal satisfaction or self-esteem from child's performances	
Athlete may feel pressured to live up to expectations implicit in signing a professional contract	
Athlete may feel pressured to increase training or play injured to receive financial bonuses or prize money	
There may be pressure applied by government and sports institutes in suggesting that sport funding is totally contingent on athletes' successes	

Table 6. (continued)

Lead up to major competition	Time of season – especially just prior to competition and during competition; competition & selection
Team selection time	
Sports where there is an emphasis on low body fat or where weight limits are imposed	
Sports with very young athletes competing at elite level	Sport specialisation at an early age; participating at too high a level for ability (especially among youth athletes)
Sports with <i>tough</i> cultures – histories of excessive training	High volume/high intensity training
Large selection pool of high potential athletes	
Pressured team-sport environment with constant comparison to others	
Implicit demands of elite sport and having to learn one's own limits	
Moving up levels or increasing commitment	
Coming back after a break or after injury/illness	
Coming to end of athletic career	
Cultures that reinforce or allow abusive dynamics between coaches and athletes	
Socio-cultural reinforcement for <i>more is better</i> attitudes	
Media reinforcements for performing injured	
National/cultural pride & reward pressures	
Coach does not understand or acknowledge psychological &/or other stressors	
Coach lacks leadership or initiative to alter training program or advise on recovery issues	
Coach lacks sport science knowledge or other knowledge about training and recovery issues	
Coach does not consider individual differences in physical or psychological resources and capabilities	Lack of training program flexibility and individualisation: team sports where coaches do not have leeway to take individual training tolerance into consideration when planning practice
Coach reinforces silence regarding or does not communicate about injury, illness or fatigue issues	
Coach pushes for early return from illness or injury	

Table 6. (continued)

Coach endorses, supports, or does not intervene in, athlete's drastic weight loss behaviours	
Family and others ignore or deny consequences of setbacks, such as injury or illness	
Family and others assume athlete is balanced – or ignore life balance issues	
Family and others are anxious about athlete's time off	
Family and others push for early return from injury/illness	
Training program lacks variety or is overly repetitive	High training monotony; lack of periodisation
When there are many non-coordinated inputs regarding the athlete's training needs and schedule	
Non-individualised training program	Individual sports with one training program for all athletes
Training program that emphasises one area of training, to the exclusion of other important areas	Failure to include recovery in training program; lack of rest days
Multi-discipline sports training program that does not take into account recovery requirements of different disciplines	High volume of dry-land or cross-training
Training designed to maintain constant peaking in performance	
Athlete has to work, in addition to training, to afford training and competition expenses	Increases in employment workload & other occupational stressors
Athlete misses out on sport science resources because of a lack of funding	Lack of monitoring for signs of overtraining
Lack of significant seasonal layoffs	Lack of seasonal lay-offs
High frequency of competitions	Frequent competition, and/or year-round competition
Sports with typically very high volume training	High volume/high intensity training
Leaving home/changing environments, going to a bigger team	New training environment; moving house, or other economic stressors; new national team status
Travel/time zone changes	Travel (especially across time zones), jet lag
Changes in physical environment - weather, season, altitude	Changes in training environment, altitude, temperature, humidity

Table 6. (continued)

Stepping up training volume/intensity	Sudden increases in training load or intensity (particularly lactate training, and especially following breaks due to injury or illness); transitions in training programs – usually from winter low intensity to spring interval and higher intensity programs
Going into a taper	Lack of proper taper
School, university, study commitments	Problems and obligations in school, increases in academic workload
Demands of being in or having a family	Conflicts with coaches, relationship problems with friends, team-mates, staff or parents
Work commitments	Increases in employment workload & other occupational stressors
Publicity/media commitments	
	Belief that feeling fatigued is equivalent to being unfit, requiring increases in training (when training loads are already high)
	Maladaptive responses to underperformance (e.g. increasing training load or not decreasing other stressors when loads are already high); desperation in response to mediocre performance
	Prolonged amenorrhea in female athletes leading to diminished bone mass
	Low tolerance for physical and/or psychological stress loads (predisposition); poor recovery potential
	Poor performance at competition

Comparing the raw data themes from the inducted tree-structure of personal and situational risk factors, to risk factors identified in the literature, it appears that when selected experts in Australian sport are asked to give specific opinions on OT risk factors, their perspectives mirror those of other experts in the field, who have worked with and researched athletes in the context of overtraining.

Summary of Study 1 Results

In general, the experts in Study 1 identified a larger number of risk factors than previously noted in the research, which might be expected, given that the other experts' perspectives on risk factors were drawn from anecdotal comments made in research and

review articles, and had not been part of studies specifically aimed at exploring OT risk factors. Most notably, compared with external experts, the experts in Study 1 were more likely to identify the coaches, family members, and others, as being contributors to OT risk. Perhaps, many would agree that the coach is very important in determining how athletes respond to and make decisions about training and recovery; nonetheless, the lack of focus in the literature on how coaches might push athletes to overtrain, create additional stressors in athletes' lives, and/or reinforce athletes' OT behaviours, suggests that this is an area that might need more attention, especially when it comes to prevention of OT. Similarly, one might take up the challenge of looking at more ways to educate parents and others about their roles in driving OT processes and outcomes, and about how they might interact with athletes to minimise OT.

CHAPTER 6: STUDY 2: ATHLETES' STORIES OF OVERTRAINING

Study 2 Methods

Participants

The athlete sample comprised 13 athletes from different sports, representing different emphases in training and competition requirements (i.e. aerobic vs. anaerobic, or primarily skill- vs. primarily effort-focussed). I have chosen not to disclose the athletes' sports as a cautionary measure to protect anonymity. Expert participants from Study 1 had identified the athlete participants as having had substantial experiences with overtraining and its outcomes. Similar to the experts, the athlete sample size was determined by saturation (when interviews with new participants no longer provided novel information). When selecting participants, my main criterion was that the athletes had a history of chronic OT, as identified by the experts in Study 1. The sampling method was designed to select athletes with significant overtraining experiences and exclude athletes who may have had only isolated incidences of performance decrement.

Ethical Considerations

I informed the athletes that participation was strictly voluntary, all information from the interviews was to remain anonymous; any personally identifying information they provided would only be available to the researchers.

Design

I originally planned to use an open-ended interview guide approach, as described by Patton (1990), and similar to that used with the experts in Study 1 (see Appendix A). At the times of the interviews, however, I found that I did not follow a strict guide; rather, I put aside any agenda and simply asked the athletes to share their experiences with OT. It became evident to me in the first interview that the stories of OT would emerge without the use of a guide, and would more likely be richer if I allowed the conversation to flow

without applying a structure. Nonetheless, I did prompt athletes for expansion of relevant OT issues throughout the interviews. All interviews were audio taped and transcribed verbatim.

Procedures

Coaches and other experts from Study 1 identified potential candidates for the athlete interviews and contacted the athletes about the research. After the experts confirmed interest from the athletes, I contacted the athletes to obtain further consent to participate in the research. In my first contacts with the athletes, I explained the thesis project briefly and asked them to take part in an audio-taped interview, lasting about 1.5-2 hours, which would give them the opportunity to recall their experiences with overtraining. I also supplied the athletes with a written explanation of the thesis project (see Appendix D for Athlete Participant Information Letter). All athletes agreed to participate in the interviews, and I obtained written informed consent from each of the participants prior to each interview (see Appendix E for Expert Participant Consent Form). At the end of the interviews I allowed time for the athletes to reflect on the process and to ask any questions of me. I thanked the athletes for their time and informed that the results of the interviews would be made available to them upon completion of the thesis.

Analysis

In the following paragraphs, I outline the specific steps I took in analysing and presenting the athletes' interviews, starting from several rounds of coding and analysis, similar to the analysis of the experts' interviews, and moving to developing the aggregate case studies.

First, Second, and Third Rounds of Coding and Analysis.

Initially, for the first three stages of analysis of the athlete interviews, I applied the same processes as with the expert interviews. I went through each interview in its entirety,

sentence-by-sentence, and selected data according to relevance to OT. Then, I made several further reductions by cutting out material that I had included originally, but which, upon closer scrutiny, was not relevant to the OT context. Subsequently, using the QSR NVIVO software package, I initiated a round of free coding of the data, which comprised selecting specific, smaller chunks of data, or quotations, and labelling these specific chunks with headings representative of their content. The free coding processes resulted in 534 passages being coded under 102 headings. I then conducted a more in-depth analysis and organisation of the passages from the 102 headings, with the same goal, as previously with the experts, to develop a tree-structure of major categories and subcategories of risk for OT. This third round of coding resulted in 126 specific headings, coding 528 passages. Similar to my coding and analysis of the expert interviews, I also kept an ongoing reflective journal of my thoughts about the athlete data, the flow of my research, and what I saw emerging from the interviews.

Shift in Analysis

At this point, I was starting to feel that the athletes' interviews had a qualitatively different feel to those of the experts, and that an inductive content analysis of the athlete data would probably lose the most valuable parts of the athletes' interviews, the detailed experiential element. After some discussions with my supervisors about the differences between expert and athlete data, I decided to present the data from these two studies in different formats. We agreed that I would present the athletes' interviews as aggregated case studies, combining several different athlete interviews to create a smaller number of narratives, which were based on the actual lived experiences of the 13 athletes. I preserved the realist element of the tale through the inclusion of verbatim quotations throughout the aggregated case studies, and added my own confessional elements as interpretations of, and reactions to, the athletes' stories. The aggregated case study structure allowed me to

avoid significant repetition in telling the athletes' tales, resulting in parsimonious presentation of the athlete data. This format also allowed me to give rich, detailed accounts of athlete experiences with OT, while protecting the confidentiality of the athlete participants. Furthermore, by combining the 13 interviews to create three stories of fictional athletes, I was able to cut down substantial overlap in the narrative themes. With respect to this form of representation, the aggregated case study approach shares similarities with the sociological methodology of ethnographic fiction, and with the sociological traditions of creative non-fiction and literary non-fiction (Sparkes, 2002). Similar to methods used in these sociological approaches, I have employed fictional devices to protect vulnerable groups, to allow me more freedom in ways of presenting factual data, to invite the reader to "viscerally inhabit" the world of the athletes, to capture more completely the emotional texture of the tales, and, I hope, to reach a broader audience (Sparkes, 2002, pp. 150-153). Nonetheless, compared to an ethnographic fiction, which could be described as a sociological examination of a culture or sub-culture, the case study approach represents a systematic psychological analysis of individuals, which would not be found in an ethnographic fiction.

Developing the Thematic Structure of the Tales

Together with my supervisors, I worked to draw out the major narrative themes that constituted the final outputs of the 13 athlete interviews, which were the three aggregate case studies. To draw out the narrative themes, I read through all the interviews again and wrote up summaries, profiling the athletes and their experiences with OT. I then grouped together the athlete profiles with significant commonalities, resulting in three groups of athletes, from which I created three fictional characters, who would become the subjects of the stories. I discussed these profiles with my supervisors, and together we came to agreement on three distinct stories of fictional athletes, which emerged from the data:

(a) The story of a professional footballer driven to abuse his body by a relentless machine of economic forces, clichéd slogans, tough sport cultures, and traditional abusive practices, (b) the story of a triathlete driven to over-extend his body in the pursuit of the mythical *Holy Grail* of achievement in his sport, Olympic gold, and (c) the story of a young gymnast turned cyclist driven to distort and damage her body by abusive coaches and a pushy, over-involved mother.

Writing the Tales

To initiate the write up of the aggregate case studies, I read through all the athlete interviews again, and reduced each interview to a series of select quotations, which I deemed most salient to developing the athlete stories. From here, I made notes on each of the quotations regarding minor narrative themes. For example, for the story of the professional athlete, a minor theme emerging was the pressure to gain and/or live up to contracts and endorsements; once I had identified this theme, I went through all the quotations from each interview and labelled any quotation regarding contracts or endorsements with the heading, *contracts/endorsements*. By labelling quotations with minor theme headings, I could subsequently pull together all the quotations for that theme from all the interviews and then integrate them into one of the fictional athlete narratives. The result of the thematic grouping of individual quotations from each interview was that all 13 athletes' experiences were represented in some way in at least one of the fictional narratives. The writing of the tales involved choosing a core narrative structure, based on the grouped athlete profiles, and then integrating the quotations to support the story. In each of the three narratives, the quotes that were woven into the tale represented the verbatim quotes drawn from the athlete interviews, thus maintaining the realist element of the tale. For each story, I also included significant confessional elements, drawing on my own experiences as an athlete and as a sport psychologist to offer critical reflection. The

drafts of each narrative were discussed in detail with my supervisors, and revised until we were satisfied with the structure and content of each story.

Protecting Anonymity

Within each of the three aggregate stories, I was careful to alter any details in the quotations that might identify the real-life athletes, whose experiences were the subjects of the tales. For example, to protect the identities of the athletes, excepting the professional footballer, I chose the sport of participation for the fictional characters from sports not represented by the actual athletes whose quotations substantially contributed to that story. I felt that the footballer's anonymity was protected because of the large number of athletes participating in that sport in Australia, and the lack of other identifying details in his quotations. The fictional element is particularly evident in the story of the triathlete (i.e., triathlon was not included in the Olympics until 2000, yet I tell the story of a triathlete competing at both the 1992 and 1996 Games). Other facts that I altered were potentially identifying details, such as competition dates, numbers of world titles, locations of big competitions, and times of the season.

Study 2 Results

In the following three sections, I have presented the three fictional narratives, which are the aggregated case studies based on the thirteen athletes who I interviewed, beginning with the tale of Steve, a professional footballer.

Professional and Pathological: The Story of Steve

I sat down with Steve; he was immediately friendly, eager to share his story. He had retired 2 years prior to our interview from a successful professional career in the Australian Football League (AFL). He played 11 years of senior football, a 200-game player, and had won a premiership, the *Holy Grail* of the AFL, equivalent to the Superbowl in American football; yet, he carried a subtle sadness about him, a sadness that

would be shared in his story of overtraining and injury. Steve seemed to have some regrets about his career in the AFL, and he wished things could have been better. He thought that maybe he could have left the sport with much less damage to his body, or he could have ended his career more gracefully, if he had not been driven constantly to play with injury. He was here to tell me his story of how he felt compelled to abuse his body, trying to live up to the expectations of the footy-mad public, fighting to withstand the burgeoning economic pressures in professional sport, and struggling to overcome injuries in one of the roughest team sports in the world.

Steve grew up with a family legacy of successful athletes – grandfathers, grandmothers, mother, and father – all National level athletes in their sports, and I had the sense that this legacy had a strong influence on Steve’s football career (on which I will elaborate more, later in this story). Steve seemed to have followed his family traditions and pressures. He took to the sport of football at age 6, and never looked back.

What struck me were Steve’s early comments that he did not have an overwhelming ambition to play professional football.

I’ve never had an ambition as a kid actually to play footy. My parents . . . I thought they probably pushed a little bit to play, and they, obviously, like most kids, they drive you here and there, but it was more like a progression thing than an ambition to play top line sports, like you just did it because you’re probably good at it.

It seemed odd to me that Steve reported a lack of ambition and strong desire, when many athletes might recall having dreamed of reaching the pinnacle in their chosen sports from a very early age. Certainly, it was my own experience to have grown up with the dream and the ambition of athletic success. Steve did not go into detail here about the role of his parents in his motivation to play footy, but I took note, filing this comment away, waiting to see if he might bring up more issues about the influence of his parents later in the interview.

I did find it intriguing that Steve seemed to downplay his ambition because it went

against many of the stories I had been hearing. It was as if he just fell into the sport because he happened to be good at it.

So naturally you do things that you're good at because it probably makes you feel good or whatever. So I never had ambitions to play league footy. It was just, "OK, I'm at that level so, oh, that's what I do." Then get drafted and play at top level in South Australia, and you think, "Oh well, might as well go to the VFL, try that," which came to the AFL. You think, "Oh well, that's what you do," and you just play. So, it was not really ambition.

I wondered how these comments about lack of ambition and potential parental pressures fitted in with the overtraining issues that arose in Steve's career. Maybe Steve was a victim of others' ambition, or maybe he was a victim of his own ambition to win the love of others by being a great athlete. It made me think about that bit of sadness I had detected at the beginning of the interview. Why was this successful guy, with an enviable history in professional sport, not really all that happy as he reflected back on his career? Why did he look back and question his own motivation or ambition? I wondered if distancing himself from ambition to play pro football helped him cope with the disappointment he faced during his latter years in the game, years spent battling injury and overtraining, and enduring public scrutiny. I also began thinking that a professional athlete's career is not as enviable as it first would seem to the outsider. I was keen to hear more of Steve's story, about his journey through the pathogenic world of professional football.

Despite his apparent lack of dreams and high ambitions, Steve did love the game. He described some of the things he would miss when not playing anymore, such as the rush of playing in the big stadiums, the thrill of hearing the screaming fans.

The adrenalin . . . you're used to running out . . . and it's an emotional roller coaster. You're up; you're down! Then you go from running out in front of 60 or 100 thousand people to no longer playing anymore. It's like, "What do I get to give me a kick?"

He also voiced fears about how life would be without football.

One day your career could be over . . . and if your whole life's just been focussed around being an athlete, all of a sudden it's gone. So where do you fit in the world?

You've no longer got the adulation or the people talking to you and wanting to do things for you anymore. Two years after the game it's like, "Steve who?"

Steve's comments here about the fear of what life would be like without football made me think of what a few of the experts in Study 1 had mentioned about athletes being at risk for overtraining near the ends of their careers. It seems that professional athletes sometimes get caught up in pushing themselves too hard as they fight to prolong their careers, clinging to the transient fulfilment from the adulation of the fans, and from the adrenalin rush of being a performer on the big stage of sport. Despite claiming little initial ambition to pursue football, it sounded like Steve developed an identity around being a professional performer, being a person loved by thousands of fans. In getting injured, however, Steve descends from being *somebody* into a state of identity panic, as the loved and admired identity slips away. I have heard of other athletes, coming to the ends of their careers, describing their last few big events as exceedingly important to them. I have also heard numerous times, in the media, athletes announcing that they want to retire on a winning note, preserved in the memories of the public as champions, as winners.

I knew it was the end of my career. Going out on a good note, that was the last thing I wanted to do. . . . I just had things I wanted to achieve, and then I wanted to move on to my next life, and I'd always said that. I didn't want to just be in it for the sake of being in it.

Unfortunately, athletes facing such transitions, like Steve, often resort to excessive training. Training harder and longer becomes the perceived antidote to their anxieties, the anxieties stemming from fears of being forgotten, fears of fading away, fears of being remembered for weakness, injury, and poor performance, fears of being nothing. The problem is that their aging bodies often cannot tolerate the strains of the overload training; they require more recovery than they used to at younger ages. Ultimately, overtraining does not work well as a coping mechanism for the anxieties; it might be compared to using alcohol to help cope with emotional pain; at first it works, and then it becomes part of the

problem, the paradox of self-destructive coping. The overtraining behaviours result in the athletes' fears being realised, as the athletes descend further into states of performance decrement, prolonged fatigue, injury, and illness.

For Steve, however, the pressures to train through injury, to push harder, and to neglect recovery were not just isolated to this transition period at the end of his career. Steve expressed the feeling that he was caught in a manipulative machine that did not allow for individual differences, that dismissed any possibility of human weakness and the needs of the human body for recovery, that heralded gladiator-like performances where players limped onto the field and played despite severely damaged bodies, and that demanded entertainment to appease the appetites of a sports-crazed public. He was trapped by the relentless machine that is professional sport.

I could not help but think, "Hey, at least you got paid to do something that you loved to do!" I have known many amateur athletes, including myself, who have chased sport glory for many years and have had nothing more to show for it than wounds, scars, and chronic injuries. I realised, however, that I was having a rather narcissistic response to Steve's story, probably stemming from feeling that I did not reap the rewards that Steve had from sport. Nonetheless, more often than not, the issue of getting paid for performance seems to be a major risk factor for overtraining. Steve made it clear that contract issues, and the financial pressure involved with being a key player in a multi-million dollar industry, often prompted poor decisions from coaching staff and others about athletes' health and readiness to play. Steve told me a story of how being out of contract put him at risk for overtraining and injury. The irony of increasing Steve's risk for injury as a result of trying to avoid injury was not lost on me.

Before I went to [the new club] I was out of contract, couldn't negotiate. I didn't have a contract, so had to organise another club to go to, and I missed the first 4 weeks out of the pre-season. . . . Did 4 weeks training, then had Christmas, and then they started playing games after Christmas. My management team didn't want

me to play because I wasn't contracted anywhere, chance of injury, and the club didn't want me to play in practice games. So, I wasn't doing all the work, because the club I was training with, their preparation was basically playing games. So, I didn't actually do a lot of training, and then I got picked up by [the new club] and, at that point of time, I had missed out on probably 2 months, 3 months of really hard training. So, you are behind the eight ball to start with. You haven't got match fitness. You haven't got the capacity to run the whole game, and then I got injured.

Experts in Study 1 had pointed out that coming back and training too hard after a break puts athletes at greater risk for overtraining and injury. Steve did not appear to have had a lot of choice, because of contract negotiations, about getting himself physically prepared for the intensity of match play after returning from the off-season break. There seemed to be no doubt that money is a big motivator for most people involved in pro sports; Steve was aware of the dollar's influence, "There's always that financial incentive to come back early and actually play, and then you do."

Steve also commented on how the pressures of a professional contract, which often are associated with players coming back too early from injury or not communicating about injury or fatigue, can be different for players in different situations.

They've got some people on fixed contracts, and then they've got kids who get paid per game. "Play him. We've already got to pay him this amount of money. Rather than if we play this kid we've got to pay more . . . because he's on a per game basis, so we lose twice." . . . When you're on a contract and they are paying you good money, they expect you to play. They don't care that you are injured. They want you out there playing. . . . If you're on a fixed fee contract, which most of the top players are, they get paid a fixed fee for the year. You're injured; you still get paid. Therefore, the pressure is on you from the president down.

On the one hand, athletes getting paid on a per-game basis could be motivated to keep silent about any niggles, injuries, illness, or fatigue, because they want to earn the bonus for playing that game. On the other hand, players on fixed contracts get the pressure to play from management because the team is trying to cut costs. In effect, there seem to be different pressures on different players, but every player ends up feeling pushed, possibly to unhealthy training practices. Having worked for an AFL team, I have witnessed players expressing contract concerns. During these times of contract uncertainty, some players

seemed to have been tempted to push through injuries, or might have chosen not to disclose feeling fatigued or sore to the coach, especially junior players hoping to get offered contracts to be full-time senior players. For Steve, the money pressures were substantial. Once again, I caught myself thinking, “Being a professional athlete is not as fantastic as it seems to the outsider.” I could see how society has created an image of the supreme physical being, the richly rewarded professional athlete. It is an image to which the athlete becomes attached, an image that is constantly reinforced by the media, by the public, by the coach, and by the athlete’s own needs to form an identity. Steve was definitely caught in the pressure cooker of pro sport, and it seemed that he saw no escape. He commented, regarding contract pressures, that one cannot escape even the scrutiny of one’s own teammates.

There’s also player expectation, “Oh, he’s getting paid a lot of money, but he’s not working hard.” . . . “He’s getting more money, and he’s useless.”

At this point in the interview, I was beginning to get a picture of some of the significant overtraining risk factors inherent in professional sports, such as the AFL. It seemed that one of the major themes coming out of the interview with Steve was that injury is inevitable in the AFL, but poor injury management, often prompted by financial pressures and constraints, paved the way to all sorts of overtraining issues. Injury management (or rather mismanagement) was an area of Steve’s sport where there was considerable reinforcement to neglect recovery, to keep silent about pain or fatigue, and to play while injured. The financial pressure was just one of the significant factors prompting footballers, as well as their coaches and other training staff, to make poor decisions about training and recovery.

In thinking about the relationship between injury and overtraining, I reflected back to when I started this research and how I had previously had a one-dimensional perspective on overtraining. I had understood overtraining as something consisting of a serious fatigue

syndrome, called overtraining syndrome, which was probably not common among most athletes, and likely to be restricted to endurance types of sports with heavy training loads. Several authors in the overtraining literature had commented that injury could be an outcome of the process of overtraining (e.g., Kibler & Chandler, 1998), but several others had not included injury in research or definitions of overtraining (e.g., Raglin, 1993). What I was seeing with Steve's story, and, as it turns out, many other athletes' stories, was that injury is an intimate part of overtraining. It can be seen to develop from excessive training, from neglecting recovery, and from stress overloads of any types, including social and emotional stress. Injury might be the most common outcome of overtraining behaviours across all sports. Upon broadening my understanding of overtraining, I started to see that my own experiences with injury during my quest to go to the Olympics in rowing had resulted from overtraining behaviours, essentially pushing myself too hard in a specific area, and not allowing for enough recovery.

Steve talked a lot about injuries; they seemed to rule his life at times. The sadness that was part of Steve's memory of professional football appeared intimately connected with injuries. From the way Steve described his experiences, he was almost constantly living in a damaged state, and there never seemed to be adequate time to rehabilitate fully from injuries. Steve said, as an injured player, he had the perception that he was always behind the rest of the group, that he was always trying to push himself to do more to catch up, to make up for what he had missed.

One year I came off having two knee injuries that I had had from the previous seasons, so I had operations on both knees, and, therefore, I didn't really start training until January, because of the rehab and all that sort of stuff. So I didn't start running until January, and I had missed out on all the 2 months prior to Christmas. Then you've got another month of solid running before you even re-join the group. So, you're down on touch and kicking and skill work, and you haven't got that three months of extra base, because you couldn't run, and couldn't even cycle. . . . You never catch up because it's a fine balance. The more you do, the higher the chance of injury. So, it's a very fine line between doing too much and not enough. When you come through that, you try and catch up. You try to play the

games, but you are not prepared to play the trial games because you haven't done all the work, but you played because you've got to get some fitness. Then, coming off being behind, in the pre-season, I strained a quadriceps. Therefore, I'm out for another couple of weeks with that, and I'm getting further behind in my fitness because I'm not actually out there to train. Then, coupled with that, on the Wednesday before the first game I got glandular fever (mononucleosis). So that topped the whole thing off, and it was out the door.

From this account, I could see how feeling behind seemed to set off a chain of unfortunate events and maladaptive responses, ending with Steve getting dropped from the team. The perception of always being behind, of always trying to catch up, can be a powerful motivator for an athlete, such as Steve, to push too hard. Yet pushing too hard, pushing to play despite pain, injury, and illness is not just a response to feeling behind. Steve talked to me about how coaches and other staff pushed athletes to play with injuries.

It's a lot of pressure, but then the coaching staff also forget. They know you're injured when they're in the calm of a normal week, but under the intensity of match conditions, they see you not being able to do something, and, all of a sudden, they say "What the hell? Go out and tell him. Give him a rev." You know you can't do any better because you physically can't do it, but they forget because they know what you can achieve, your high level of performance, and, if you're not performing to that, there are questions asked, and then they get different opinions of you, and you can, all of a sudden one injury can, especially for a young kid, can make or break their career.

Listening to Steve talk about the coach's demands, and lack of acknowledgement for his struggles with injury, made me feel irritated, and that irritation, in part, probably stemmed from my identification with Steve, from interpreting Steve's experiences through my lens. What are these coaches thinking? I know from my own experience, and from other athletes I have seen, that most athletes really would like to continue playing, no matter what. Having the coach question Steve, and unfairly judge his ability while he is injured, because the coach is too caught up in his goals of winning the match (and keeping his job), seems unjust. Steve voiced his frustration at his coach's blindness to the situation.

Having the coach demand that you play even though you were injured. . . . "God, coach! There is nothing more that I would want but to be injury free and playing 100%."

Steve protested that the coach did not see the situation for what it was; Steve was a player limited by injury. Unfortunately for Steve, he was caught in a culture of hyper-masculinity, and in that pathogenic culture, being injured was like being castrated, an emasculating experience. As a result of the coach's actions, Steve claimed that he was left with a dilemma: play to please the coach and risk more serious injury and poor performance, or sit out and risk the scorn and judgment of the coach and others.

You could play up in the senior ranks for three games, and then go out and play with an injury because you are young. You think, "Oh shit! Do I manage my body better?" And you've got, say, a groin injury, and you go out and play and then, all of a sudden, you play two bad games. You get dropped. Your groin's no better. End of the year; you're still injured. "Nuh, he's no good. Get rid of him," because all they remember is the last game you played. The last thing in their minds is what they remember you by. And that's just the way it is, and so there's so many pressures.

Steve suggested that, for young athletes, the answer to the dilemma usually is to please the coach by getting out there and playing. Something was telling me, however, that Steve was not just limiting this dilemma to young players. It seemed to be one that he had faced throughout his career, even as a more mature player. I also thought back to Steve's earlier comments about parental pressure and wondered if there was a subtle unconscious link being made here between needing to please the coach and needing to please a parent, a thought that I would continue to hold as Steve's story unfolded.

In addition to a demanding coach, it seemed that there were plenty of staff members, including the medical staff, who colluded in encouraging Steve's overtraining behaviours, especially with reinforcement for playing with pain and injury.

I've rung up on the day of the game, and I had a back spasm on the day of the game. That morning I rang up to the doctor to say I had back spasms, went and saw the doctors. Rang the coach, and coach went ballistic at me for being injured, "Oh, it stuffed up all my plans!" "Crikey, Charlie! I can't play." I couldn't walk. How do you expect to play? They just lose control. Even the doctors were saying, "Oh, we'll jab this, jab that, to play," and I'm thinking, "I don't really want to. My body, if I'm injured, my body's telling me I'm not right to play, and you want me to play?" That's a high-risk game. A lot of times you're going to fall over. You might get away with it once, but you keep doing it. It's like a game of Russian roulette;

eventually you are going to cop one with a bullet. It's a vicious cycle, and you're really only a commodity, that's all.

Steve presented an image filled with disillusionment, expectation, and sadness: "You're really only a commodity, that's all." I sat there looking at Steve, imagining what it might feel like to be seen as nothing more than a commodity, a thing, not much more than a bottom line on a budget balance sheet. In the face of serious, limiting injuries, football players are being asked to get on the battlefield, to face the bone-crushing tackles that are part of the game. Sadly, Steve's support system consisted of a doctor with a syringe full of corticosteroids, the drug of choice to distract the athletes from their pain. Furthermore, it sounded like the frustrating aspect for Steve was that he could see, clearly, that he was doing the wrong thing for his body. He was trying to object to playing, but his objections tended to get drowned out by the clamour to play. I was fascinated by Steve's report of how being aware of his physical needs was not enough to overcome the coercive pressure to continue to play while injured because it made me think of my own experiences in rowing. I was doing a PhD on overtraining and injury during my last attempt to make the Olympic team. I had considerable knowledge and awareness about recovery, about my physical needs, and I did not always have people directly calling for me to keep competing when I was hurting, but I still felt compelled to compete and train with pain and injury anyway. Now, here was Steve with overt, direct pressures to play with injury. Did he have a choice? Did he have a voice that could be heard? It did not seem so. At times, Steve suggested, that his coaches might have showed some insight into pushing too hard and not allowing enough recovery, but too often this insight only occurred after the damage was done.

Although there is a lot of overtraining, the thing is that the majority of the times the player knows his body better than anyone else, and it's scary, and it is like you've been there; you're feeling sore for some reason, so you tell the medical staff, but, "Oh no, you go out and train." You say, "I've got a sore hamstring." "Oh no, you'll be right. Go out and train." The medical staff are in a Catch 22; it's a fine line,

balancing act between sending a player out to play and putting him on the injured list because the coach wants the players. It might not be in the best interest of the players, but the coach needs the players out there. . . . Because you're an elite athlete, "OK, you've got to play with some pain." You go out there, or you do extra, and the thing is, "I know it's not right . . . I'm a high risk here!" . . . And when you get out there the coaches forget about your injury, and they say, "Run harder," and then you end up doing a hamstring . . . and it's like, "Oh, in hindsight, oh I shouldn't have trained you."

From this last discussion, and the comment about doctors using cortisone injections to dull the pain of an injury, I found myself wanting to hear more about the medical techniques that were being used to augment the coercive forces to play while injured. Steve readily gave me several examples where injections were used to get him back on the ground. I am not a medical doctor, but it is my understanding that cortisone injections might help with reducing inflammation of an injury, which might help with healing during a course of rest and rehabilitation. Steve's stories, however, seemed to show that these injections were being used to mask the pain of an acute injury so that an athlete could continue to play, but at the risk of getting much more seriously injured.

I remember . . . when you play, the coaches don't really care. They just want you out on the ground. I have played with stress fractures in my feet, having injections where they've stuck the needle in . . . didn't work, and you just come up, and coaches say, "No, you've got to play." . . . One year I came off, and I've been in a collision, and I've cut my forehead open, and someone slid into my ankle, and I had to come in to get my head stitched up. You go to the doctor and you say, "Oh, I've got a sore ankle," and he said, "Oh, have a look. See if you can run up and down there." And I said, "I'm sore." So, he put 4 injections in it to try and kill the pain, and I go back out, and I went for a run, and I said, "No, it's still sore. I don't think I can go back on." And as soon as you tell the coach you can't go back on . . . at a break . . . the coach just walks straight past you. It ended up I had a broken ankle and was out for 7 weeks.

Using such exploitive medical practices sends a message to athletes, coaches, and others about how drugs could be expected to help with injuries, and, more importantly, that playing with injuries under medication is *what you do*. Such practices get perpetuated in sport when they are not questioned, and athletes might get involved in self-medicating behaviours so that they can continue to play or compete.

Yeah, I got the injection, and the next day, after our final preparation camp, I started trying to compete on Panadene Fortes [paracetamol with codeine], just chewing them down like they were nothing. I couldn't do it. I couldn't jump. I'd try to take off, and it felt like a knife was going into me. So, again, had to make the decision and spoke to team management and said, "I'm out. Sorry."

I was affected by the image of Steve "chewing down" pain killers in an attempt to keep competing because it made me think of my own desperate attempts to overcome injuries with any methods available. It seemed like a futile attempt to fix a problem that could not be fixed with more masking agents. Are self-medicating behaviours, masking pain and injury, in the name of sport glory, the types of behaviours that one would applaud? I do not think so, and Steve also seemed to agree, pointing out that he was aware of what was going on around him, and that many things were not right with respect to the pressures to train and compete with injury. I could see from where some of the pressures were originating, such as from financial strain, but I guessed that there were more things behind Steve's overtraining. What other factors were driving Steve to push himself too hard sometimes, to neglect recovery, and to succumb to pressures to perform when the likelihood of further damage was high?

I was getting a better understanding of the culture of Australian professional football, and how overtraining behaviours were accepted and encouraged within the sport, perhaps not unlike other sports. Steve did mention that, early in his career, he was doing extra training to try to get ahead.

Obviously, trying to get to a certain level, you've got to do the extra running and weights and build yourself up. In the past, especially in the start of my career, I used to go out and do extra running, do speed work. You find sprint coaches and all that sort of stuff, and you just did it, and get with a coach or skills coach and do extra kicking skills and that sort of stuff.

It seemed that Steve had some internal drive to do extra training, despite his many comments about the pressures coming from around him in the sport, and despite downplaying his ambition to play professional football.

I've overtrained. I'm one who likes to train myself and not do the group training because I think I know what's best for my body at times, because group training normally becomes so robotic, and you do the same thing all the time, so it gets boring. They don't put enough variety into training, but yeah, I have overtrained. . . . Well, I mean, I always do that little extra bit, but I never told them that I'd do it. . . . I don't feel the need to go and brag. What I do in my free time, they don't need to know.

Looking back across his career, Steve also acknowledged that this extra training was related to several serious injuries.

You get to the point where my last two injuries were degenerative injuries. I had a hernia, and I had to have a tendon cut in my groin so it released some stress, got holes drilled in my pubis bone because it was degenerating. . . . Had an operation on my knee. . . . It was a degenerative knee complaint. That's just obviously from running on roads, extra training, and doing the whole thing the whole year. You do your normal training, and then you think I want to do a bit more speed work or do a bit more fitness, and you do that on top of it, and you just load the body up with more work. You don't get enough chance to rest.

Thinking about Steve's internal drives to push harder and do extra training, I thought back to the influence of Steve's parents, at which he had hinted early on in the interview. As the interview progressed, Steve came back to his parents without me having asked about them. Steve did not begin talking directly about his own experiences as a young footy player; rather, he talked about junior footy in general.

So the scary thing is that . . . it goes all the way down to junior footy. . . . They say, "Oh, the AFL do that, I reckon it's good for my team." . . . It is just scary. They're taking kids at 10 years old training them like they're professional athletes. At that stage they've got to have fun. . . . You don't need to train them, just give them a ball and have a kick. . . . They don't need to do 5 km runs, 400 metre sprints, doing the whole fitness program. It's just ridiculous. Let them get out there, have a kick, and just enjoy themselves. I don't know why they just don't . . . just let them go out there and play. They're trying to make young people into professionals, and they don't need to.

It seemed to me that Steve was referring to his own experiences as a 10 year old boy, how he might have felt pushed as a junior to be a professional athlete. Steve's next few comments went directly to the issue of his father's over-involvement in his sport.

Immediately, I could see from where some of Steve's internal drives were coming; perhaps, it was how he, as an adult footballer, could have fit easily into the dynamic of

wanting to please the coach, a new father figure.

They've got expectations, and parents are the worst. Parents, realistically, and I was probably under pressure, your parents expect you to play and expect you to do well, and you go out there, and you play, and you know it's like, if you don't play well you're going to hear about it.

It sounded like Steve really “heard about it” from his parents when he did not play well. I was fascinated, however, by Steve’s guarding of obvious anger towards his parents for the pressure that he felt. He says that parents are the *worst*, but then comments that he was *probably* under pressure. He also uses a distancing presentation by putting his comments into the second person (you). The fascinating part for me was how Steve’s guarding of anger is something I have seen quite frequently in my therapeutic interactions with people, as well as in my own life. I think as children we have trouble expressing anger toward our parents, because we fear that our anger will negate their love and acceptance. Steve’s next comments erased most doubt in my mind about whether he had received coercive pressure to play injured, even as a child, and that his father played a significant part in influencing Steve’s overtraining behaviours as a senior footy player.

When I was a kid, I always played 2 years above my level, and I played with my brother, and my Dad coached me, and I broke my fingers, and I remember it clearly. I must have been about 8, 7 or 8, and I am playing in the under 9’s so everyone else, every kid is two years older than me, and I’m the smallest one. Broke my fingers, and I remember my Dad; he was the coach, he said, “Well, if you’re going to whinge, get off!” I went to the hospital, and I had a broken finger.

The image I had in my mind was enough to make one cry, a 7-year-old, the smallest one on the field, broken finger, being told off by his father, the coach, in front of all the other players, for being upset about real pain. What alternative is left for the kid but to try to suck it up the next time he is out there feeling the pain? From Steve’s next few statements, it sounded like humiliation was a tactic that was not used sparingly in the world of junior footy, and was not limited to injury concerns.

Coaches are like that. Coaches get their own ego, and I’m not saying that’s my Dad, but it’s the whole, the same principle. Coaches get in that mentality, “We’ve

got to win. We've got to win!" And the parents are the same, and the worst people are the parents. They just slag off all the time and abuse their kids for making simple mistakes. We all make mistakes, and the expectations are incredible on the kids. You see why they don't want to play sports, because the parents put just so much expectation on them. Ok, it's alright to push them, well not push them, but encourage them to play something, and playing in a team sport is probably good for kids . . . but they go overboard, I think, a lot of the time. Yeah it's an interesting one.

Steve says he was not describing his Dad, but I felt he was describing his Dad. The contradictions were palpable: he is defending his Dad, but then saying that parents are the *worst*, for the second time; it seems that he meant to say that *his* parents were the worst. Perhaps, Steve really enjoyed the game of football, but the fun was taken out of it by a father who always emphasised winning, verbally abused him for making mistakes, pushed him to play with injury, even at a very young age, and expressed overwhelming expectations of Steve's performances. Steve's first comments about not having had personal ambition to play professional football seemed to make more sense now. The sadness I had sensed also seemed to have sources beyond football. Although Steve had said that he loved the game, it appeared that the ambition belonged to his father. In some ways, I see Steve's story, paradoxically, in parallel and in opposition to my own, where I had a good, supportive relationship with my own father, a former Olympic rower. I was neither chastised by my Dad for making mistakes, nor felt pressure to compete with injury. My father was the opposite, I think. He encouraged me to have fun, to take care of my body; he said mistakes were okay. Nonetheless, our stories overlap in significant ways. I still felt the pressure to please my Dad, perhaps similarly to Steve, to show how good I could be, to win his love with my athletic achievement, to make him proud. That dynamic between a father and a son can easily be transferred to a coach-athlete relationship. I imagine that, in the often abusive world of professional football, with its pathogenic foundations, it was all too easy for Steve to get sucked into that unhealthy father-son dynamic with a coach. It did not take long before Steve was telling me about the abusive

old-boys culture of AFL, a culture of humiliation, of guilt, of alienation, a culture where the coach is the king, and his word is the law.

Footy comes from an old world perspective, it's not up-to-date in how they do things. . . . It's an old culture, totally old culture. It's old world. There's nothing revolutionary about footy, the same tactics and principles. Okay, some of the science might have improved, but the mentality, a lot of it hasn't improved. . . . It's a macho game. You get all the fitness people in, and their whole preparation goes straight out the window if the coach, all of a sudden, on a whim says, "No, we're doing this, and that's what we are doing," and the fitness programmer says "Oh fuck, how am I going to . . . I've got to re-jig my whole programme now because the coach wants to do this."

From what Steve was saying, it seemed that it was difficult for anyone to question the coach on anything, sort of like a young boy finding it hard to confront his father. Steve related how an atmosphere of guilt, created by the coach, which did not seem so unlike what he experienced as a junior, often left him feeling terrible about his injuries, and might have driven him to manage the injuries poorly, sometimes returning to the game too early.

You never play a game of footy when you're 100% fit; it's just degrees of how mentally strong you are to be able to play with an injury. . . . At a footy club, as soon as you're injured, and you're no use to the coach, most coaches just won't talk to you; they just ignore you. They only want to know you when you actually have some benefit to them. I've been in a situation with long-term injuries, like with my groin, with my knee, and you're at a footy club; you just feel like a spare part. No one really talks to you. People come up and say, "Good day," but they don't really care. It's only a brief comment because you are not actually physically participating in what they are doing.

A "spare part?" That phrase echoes Steve's feeling of being a "commodity." Those were not the words I would have expected to hear a successful pro football player using to describe how he felt around his own club. Steve recounted how being injured was an alienating experience. He was ignored by the coach, and ended up feeling victimised for something that was a normal part of the game, dealing with injury.

It gets to be a drain, like, you just hate going. And from the supporters, to the president, to the coach, "When are you coming back?" "Oh, indefinite, and just long term." They get sick of asking, and, in the end, they don't really care because they have to design their team around you not being there. So, therefore, the coach . . . will walk past . . . but he won't stop and chat to you about it because he's got nothing to talk to you about.

I imagine that the alienating experiences of feeling ignored around the club, while injured, added more to the coercive pressures for Steve to come back too early, to train excessively, and to keep silent about niggles on other occasions. Steve commented how he felt those coercive pressures, and responded to them in maladaptive ways.

You just feel like you're useless. You want to get back because you want to be accepted and, therefore, you end up doing further damage because you try and progress yourself beyond the point where you physically can do it.

Steve wanted to be accepted. Here he was, a member of a successful football club, an established player, and a premiership footballer, and he felt ostracised; he just wanted to feel accepted. The emotions behind those words were palpable; the words sounded like they could have just as easily come out of the mouth of a 7-year-old boy with a broken finger, yearning to be loved by his Dad. Steve's last few comments here, regarding the coach making him feel guilty about being injured, and ostracising him from the group, made me think about what one expert in Study 1 had said about family abuse dynamics being replicated in the coach-athlete relationship in competitive sport. The expert had mentioned how an athlete will end up overtraining to try to please a demanding coach, the object of his attachment, who has replaced Mum or Dad. Were the traditional practices in the sport, including the way coaches communicated with athletes, likely to put athletes, such as Steve, at greater risk for overtraining? From what Steve had described, overtraining seemed to have been a regular part of the culture and traditions in Australian football, and the practices not only encouraged players to push harder in training, but also prompted maladaptive responses to injury, fatigue, and any other physical setbacks.

At this point, Steve commented that the coercive actions of the coach went beyond ignoring him and making him feel guilty. At times, the coach publicly humiliated him.

Coaches have said, "You're weak. You're a weak dog," or, "You're gutless. You're scared. You didn't put in," in front of your mates. . . . And I was thinking, "I will perform better if you build me up to think I'm better than I actually am. At least I

can perform at some level, but if you make me feel crap you might get a response out of me for 5 or 10 minutes.” When that emotion to prove the coach wrong is gone, I’m going to think, “Yeah, you’re a prick though, because you said this about me or that about me.” We’ve had examples where coaches have gone and, in front of everyone, showed a highlight of some guy pulling out of a contest and just replaying and replaying it. I’ve been in a situation being bagged about something, or being scolded about something, and you feel about this big. It embarrasses you that much [that] your teammates actually stand up for you, and it drives a wedge between the team and the coach. The coaches ball him out, and the guy’s lost all his confidence, and all his teammates are trying to pick him up, and everyone hates the coach.

So, on top of anxiety and fear, players end up feeling humiliated by, and infuriated with, their coaches. The problem for athletes in professional sport is that they are tied to the team in many other ways, especially in terms of finances and contracts, and they feel they cannot openly express their anger about unfair treatment. An athlete, like Steve, thus, may end up turning that anger inward on himself, looking for ways to cope with it, and respond by overtraining or coming back too early from injury, hoping to keep the coach off his back. Steve told me that sucking it up, keeping quiet about pain, putting in the extra bit of training, and pushing through injuries were expected in his sport.

I think it’s got to do with, it’s the culture of our sport as well. I think there are a number of things. It’s very much do or die. Don’t be a wimp. You fall; you get back up. The sport culture definitely promotes a win-at-all-costs attitude. And the whole sport tradition definitely has no tradition that fits into taking any time off or being gentle with yourself. The *no pain no gain*, I mean, as I said our whole culture . . . it allows no weakness. Nobody is comfortable with any sort of physical limitations, physical limitations are seen as excuses in our sport generally. You suck it up; you keep going, and anybody that stops for a physical reason, there’s an implication that, unless you’re almost dead, you know, you keep going; . . . it’s very much part of the culture; you’d better be dead before you don’t go on. . . . From a cultural point of view with sport, . . . being tough, it’s expected. Nobody thinks you’re brave; it’s expected; anything less is a bit revolting and weak and snivelly. . . . So, nobody says, when you play with injury, nobody says, “Oh God, you’re brave aren’t you?” It’s just, well, of course you keep going.

As I was sitting there with Steve, the subtle sadness, which had come across in his posture and his expression at the beginning of the interview, now was becoming painfully manifest, and changing form at times to regret, to exasperation, to frustration, and to anger. I think I would probably feel angry, too, in Steve’s situation. Furthermore, if it was not

enough that the coach was being a *prick*, the other staff pushed him to disregard injuries, making Steve feel inadequate for having an injury.

You go [and] you report your injuries to the medical staff . . . and then after a while they think, you're whinging, "You're just whinging. You just complain. You're not that bad. Look at him. He's got this, and he's out there training." And they pick out someone with probably a high threshold of pain and use them as a measuring stick and rather than taking each case by case. . . . It's herd mentality. "He's out there. He's got a broken rib. He's playing. You've only got a sore hamstring or a tight back. You get out there and do it because he's worse off than you."

Such coercive comparison to others can be a significant risk factor for overtraining, and, for Steve, comparisons to others came from many different directions. Furthermore, Steve talked about a sense of *the others* out there somewhere, always watching and scrutinising his game, often unjustly criticising his performance. He wanted to prove himself to *the others*, he wanted to be accepted by *the others*, and he did not want to let *the others* down. The frustration Steve expressed, however, was that many of *the others*, like the media, the supporters, his teammates, and even his friends and family would judge him on his performance, without knowing that he was injured.

I think a lot of it is, there's a hidden pressure, put on yourself for not wanting to let others down. A lot of the people play sports out of fear. They work so hard out of fear of letting others down, rather than enjoying the fun of the sport. You play and . . . you set up expectations because you play well. I'd done it to Mum and Dad and my family. When I got injured again, I just told them I felt so ashamed, and how I'd let them all down, and it was just shocking . . . Others expect from you the whole time. Then if you're not playing well, people turn really quickly, especially when you get criticised in the paper, as happens in Melbourne, particularly with players individually. Like reporters, for no reason whatsoever, they don't know the facts behind your situation. You might have injuries. I've played with stress fractures, and they don't know that, but you're still playing because your performance is dropping. The average Joe Blow supporter doesn't know that. He hasn't read it in the paper. The reporter doesn't know that. The only people that know that are the medical staff and the coach, and they ask you to go out there and play because they need you on the ground, or need you to play, and your performance drops, and everyone's on your back. Your friends are saying, "What's wrong? Why can't you get a kick or why can't you do this?" and they don't know the pressure you're under.

Steve seemed particularly frustrated with media portrayals of his performance.

"If I play well, I'm selfish, and I get more kicks than you. I noticed I'm in the

press. I'm going to get more money." It's a tough gig. It's a balancing act. You know, the press, like it or not, you read the press and, if you're getting shit-canned in the press, and you know you're injured, you think, "Oh shit. The press are giving me a hard time. I've got to train harder to get back in to play, so then they can stop getting on my back." Because everyone else reads it and thinks you're a dickhead. . . . The press get too much power.

Everywhere Steve turned, he seemed to face scrutiny, and he gave in to the pressures.

Steve played with injury; he kept quiet about his pain, hoping to please his coach, his father, the media, and the fans. Steve did extra training to try to get better than others, hoping to feel accepted, hoping that people would not think he was a *dickhead*.

As the interview was coming to an end, I paused again, observing Steve closely one final time. I could see a friendly man, a great athlete, and an intelligent, insightful football player, open to talking about his professional career. I could also see, however, a man with regrets, a man whose sadness, about how things could have been better, might never leave him. Steve had admitted to overtraining, trying to do extra, and repeatedly trying to push through injury. Yet, Steve's overtraining behaviours seemed to be products of a relentless, abusive system, of a tough sport culture, of a money-driven industry, and of an ambitious, pushy father. The system did not seem to allow space to hear Steve, and I wondered how many other hundreds of footballers were also not being heard. How many other players also carried, or would carry, with them the same sadness, the regrets about abusing their bodies, about their experiences in football? Then, I thought about the thousands of kids, young footy players, aspiring to become the future pro footballers. Would they also be resigned to the sadness when their careers ended? Here was a sport, where pushing excessively, keeping quiet about pain or fatigue, and playing with significant injury seemed to be as central to the game as kicking the ball and scoring a goal. I had been immersed in Steve's sadness for the previous hour and a half, sharing his regret, his pain, his frustration, and perhaps his feelings of helplessness. When I walked away that day, I had a new and sobering perspective on professional football, and on my own sadness about

my competitive sport experiences. I also wanted to thank Steve for helping me think more about sport, about training, about parents, and about living with regret.

Olympic Seduction: The Story of John

Steve's story had left me feeling slightly melancholic, a tale of an athlete holding onto a subtle sadness from his sport career. Listening to John's story, however, I identified with his significant feelings of loss as I listened to the tale of an athlete emotionally drained by his competitive sport experiences. John had been ranked top of the world in triathlon, successful at multiple world events, but his three experiences with the Olympic Games showed how the seduction of the world's biggest sporting event can almost destroy some of the best athletes. Like many athletes I have talked to, John started out with early success and a rapid rise in his sport; he also started out with a lot of expectations from himself and others. The early potential, the promise of future success, and the drive to be the top in the world, led to the possibility of triumphing at the pinnacle of sport, the Olympic Games. That dream, that possibility, acted on John in ways that seduced him; he was driven by an intoxicating desire to succeed in his sport; yet, he was blinded in his pursuit, and ended up behaving in a manner that assured his dream would not come true.

John's tale is about an athlete with a lot of internal drive to succeed, who had also acquired good knowledge about what worked for him in terms of training and recovery. Unfortunately, John got it wrong each time he tried to achieve his ultimate dream of Olympic gold. At his first Games in 1992, John thought he had done everything right; he was going to take the world by storm. He was going to surprise everyone; he was flying, but he ended up sick, fatigued, and unable to perform at the Olympics. At his second Games in 1996, John did not want anything to get in his way. He had been there before; he thought he knew what he had to do to be at his best, but injury, and poor responses to injury during the lead up to the Games, cast him as a repeat performer. He was devastated,

once again not being able to compete anywhere near his capacity. At his third Games, in his home country, John wanted to get it *perfect*. It was to be his last Olympics. This last time around he had more experience and tremendous success at the world level and knew the formula for winning, but he believed he had to find something extra, something superhuman, and ended up driving himself into a state of overtraining syndrome, not even giving himself a chance to compete. As the interview got underway, I could not help feeling a connection with John. He had been devastated, disillusioned by the promise of Olympic glory. It felt like something that I knew well, and I was eager to help him tell his story.

We began talking about what the Olympics meant to athletes. John said that he had dreamed of representing his country at the Olympics for much of his life. I also had imagined representing my country at the Games ever since I can remember. John talked about how he ate, drank, slept, and breathed Olympic glory. Life would be complete if he could show the world, on sport's grandest stage, that he could be the best. The image was beautiful, standing there on the podium, tears of joy running down his cheeks for his family, friends, teammates, coaches, competitors, countrymen, and people of the world to see. The dream of Olympic glory was undeniably seductive. Unfortunately, responding like a lover seduced, blinded to objectivity, John pursued the dream too ardently, too hungrily. Wanting the dream to come true so badly, John ended up seriously damaging himself three times in vain attempts to do more than what his body could handle. The fantasised tears of joy ended up being tears of pain.

On several occasions, John talked about the Olympics with an excited tone in his voice. Recalling his lead up to the 1992 games, John said he felt overwhelmed, but positive and motivated by the prospects of success and celebrity.

It was the Olympics! Holy shit! They're finally here after all the waiting! You go through and tick the boxes. This is *the* main goal. . . . This is it in front of you, and

all of a sudden you've ticked off all the boxes. Now it's the Olympics that you've always been waiting for. You've always dreamed that you're going to be the best, and you win the gold and, you know, become a household name and be a hero.

There it was, Olympic gold, and the promise of eternal love and acceptance from everyone, a household name, a hero! I had a sense of what John was talking about, having pictured myself many times with an Olympic gold medal hanging around my neck. The picture could be intoxicating, the type of image that might push athletes like John into the dangerous realms of overtraining. After his first major disappointment, however, John's overwhelming, dreamlike motivation to perform at his second Olympics started to shift more to a desperate type of motivation, permeated with fears of failure.

The closer I got to Olympic trials and the less [my back] was responding and the less I was doing, the more I'd resigned myself to "OK. Look. I've got to just get there. I've got to get there. If I don't make these Olympic Games. . . No! That is not an option!" I couldn't deal with that prospect, no way. . . . It was the biggest thing that I ever wanted to do, and I had to succeed. I mean failure was not an option.

During his preparation for this second attempt to compete at the Olympics, John had sustained a back injury, but still had enough time to respond to it, rehabilitate, and compete. I wondered how his perception that his dreams might slip away from him, once again, affected how he responded to that back injury. It made me think of what several experts in Study 1 had said about how athletes at risk for overtraining might react desperately, trying to overdo everything to get back to their sport, often returning too early from the rehabilitation process. I mused, if John had managed his injury differently at the time when it first occurred, would he have been in a better position to compete when he finally got to the Games? I also wondered if John had been blocking out the early signs of the injury while training because he did not want to acknowledge that there could be anything wrong with him. He had said that failure was not an option, a profound statement alluding to the pathology underlying John's pursuit of Olympic glory. In shutting out the possibility of failure, which seemed to be unfathomably anxiety-provoking, John created a

pattern of defensive responses that were more likely to produce the most feared outcomes than to prevent them. I would have to wait to see how John's story unfolded to understand the complexities of his behaviour that led, ultimately, to his unfortunate experiences.

In talking about his last attempt at the Olympic triathlon, John again voiced desperation. By this third time around, however, John had accumulated successes at the international level in his sport. He had learned what it took to be one of the best in the world, winning at World Cups and World Championships. The Olympics, however, held a mystique, a seductive pull that overpowered his logic, knowledge, and experience.

I knew I was getting close to the end of my career, and the Olympics were the last thing I wanted to do. I mean, this is the biggest thing I've ever wanted to do! You know, I was a realistic chance to win the Olympics.

The double meaning here in this statement about the Olympics being the last thing that John wanted to do is striking. John says that the Olympics were the last thing that he wanted to do before he retired, but, perhaps he might also have meant to say, albeit unconsciously, that the Olympics were also something he would never want to do again in his life, especially given his previous two Olympic experiences. At this third Olympic attempt, John described the pressures to perform and his fears of failure as bearing down on him like a predator hunting its helpless prey. He really began to question his ability, but he could not turn away; he could not give up the dream.

What if I can't do it? When you are on your way up, you're like "What if I can? Yeah! What if I can?" . . . When you're young and when you're coming up, you've got the pressure behind you, and under you, lifting you up, whereas when you get to the top it's like the pressure is coming on top of you and bearing down on you, because you're just like, "What if I don't live up to the expectation? Oh! What if I do that?" . . . You put pressure on yourself more than anything else because you want it so badly. So ultimately you are controlling the pressure, but most people let the pressure control them, don't they? I had to go for it. I had no choice.

From John's descriptions here, I could see that he appeared motivated to push himself; he admits to putting a lot of pressure on himself, but the contradiction between his statements, "you are controlling the pressure" and "I had no choice," suggests that he probably felt

many other pressures beyond his own internal drive. His story brought me back to one of the first questions underlying my whole research project: Where does this drive come from for athletes to do extra, to neglect recovery, injury, and illness, despite knowledge and experiences that should have taught them to pursue balance in their training and recovery? Like the promise of a professional contract, an Olympic gold medal seemed to be a huge motivator, and similar to the professional athlete, the Olympic dreamer also had a whole system encouraging and colluding with him in his relentless pursuit of success.

Looking more closely at what was driving John, I asked him about his early experiences in triathlon. Not surprisingly, like many before him, John was lured into the world of competitive sport by showing promise at an early age. He progressed quickly, accelerating through the ranks of junior and then senior triathlon. Success can be seductive. John loved it. He loved his sport. From the following statements, I could hear that John was thrilled to find that success came to him easily.

Heading towards the end of high school, I'd done really well in athletics in inter-club and especially when I was in year 11 and 12, broke a few records, inter-school records and got recognition for being a good [athlete]. . . . did my first big triathlon at the Victorian Championships, and I won under-20. I was still a junior, under 20, and I won the Victorian Title. I won the National under-20 title, and from there I never questioned it again, and I didn't look back. I thought, well, I've sort of got some instant success, and then I was hooked into it. I loved it!

John was hooked! He was good at his sport and people approved of his success; possibly, he had found a way to feel loved. Perhaps John had found a way to fill a void, a way to compensate for feelings of insecurity or inadequacy. Perhaps, for John, success became like a drug; it felt really good at first, but then he needed more and more of it to get that same feeling. With the taste of early success, and the recognition of his ability, the first act of John's seduction was complete. All that John needed now was a little prompting from the right places, and the Olympic dream would take firm hold of his psyche. The

prompting did not take long to follow; the press and esteemed coaches soon were encouraging John to push on.

I got interviewed by a few press people in the newspaper, and they asked me if I'd ever do this for 1992. . . I think it was just after the [1988] Olympics, and they asked me, "Oh, are you going to continue with [triathlon]? You broke the record!" . . . I sort of said, " Yeah, I could go to the Olympics [in this sport]." Now, why I said that, I still don't know, really. . . . So I said that as a throw away line, and I think I might have mentioned that [a particular triathlete] was a bit of a childhood idol. My coach [who was the top coach in the country for the sport] was on a plane to Europe, picked up the [newspaper] on the way out, at the airport, and read it on the plane. . . . He came back and told me I had a great amount of potential, thought I'd be perfect for Olympic [triathlon], he thought . . . I had a real future in [triathlon] and asked me for a 2-year commitment.

John did give his time, his commitment, and his heart to the sport of triathlon, as his coach had asked him to do. Similar to Steve, the footballer, John also had tremendous success in his sport. Outside of the Olympics, John had been top of the world.

I had ten years of professional triathlon, won world titles, [five] medals at world championships, so you know I've been at the top level. I knew what I had to do to get it right.

John said that he knew how to get it right; nonetheless, as the successes accumulated in his burgeoning career, John also began to experience increasing pressures as well. He felt the pressure from within, the personal drive to live up to his potential, and he felt the pressure from outside, the expectations of others, family, friends, the public, the media, and his country. It seemed to John that the one way to resolve all this pressure, to live up to expectations, was to capture the *Holy Grail* of sport, to triumph at the Olympic Games.

Looking at John's tremendous success at the world level, it seemed out of character that he repeatedly messed up at the Olympics, because he seemed to know how to get it right at other times. John even talked about having the knowledge about training and recovery to do what was best for him.

I didn't have a problem trying to do too much because I knew I'd worked out what was the optimal amount for me. I didn't need to do more volume, you know, and that's the beauty of it. It is finding out what's optimal for you, because everybody is different in what they can handle and what works for them, and it's really that

simple. . . . I was really pretty good about, generally speaking, pretty good about injuries and illnesses, and I did take it in my stride and go “OK, well, I’ve got this problem. What do I do to overcome it? How quickly can I overcome it? How quickly can I get over it?” I mean, I’d be pretty good at taking a rest if I needed it to get over something.

I took note of John’s perception of himself as someone who does not have a problem with trying to do more than he should, despite that he had done exactly that in trying to prepare for all three of his Olympic campaigns. Once again, I was thinking about what the experts in Study 1 had said about the motivational element of something like the Olympics, that it prompts coaches and athletes, alike, to look for something extra, to change what had already worked in the past. Although John did get it right a number of times at significant international events, I had the suspicion that I would hear about some behaviours and attitudes, later in the interview, that contradicted his perception that he did not have a problem trying to do too much, or that he was pretty good about responding to injuries and illnesses. Not surprisingly, in the following discussion, he dropped the first hints that he might push the limits of his training and recovery.

There were times when, you know, due to scheduling and races coming up, if I had an injury, I’d like to find out what it was, and I’d like to find out if I kept pushing through it, if I’d make it worse, or it’d just stay the same. If it would just stay the same, I could push through it for a period time until world championships were over or something and then take a rest. I’d do it that way. I mean, I’m pretty logical and pretty analytical about things.

In the preceding quote, John was maintaining that he was generally good about handling illness and injury. I wondered, however, if he were so good at dealing with injury and illness, why had he got it wrong at three Olympics? I asked John about these contradictions in his thoughts and behaviours, and he pointed out that he ended up changing his mindset when it came to the Olympics. In his first Olympics, John said he was feeling so great before he got there that he had reached a point where he was feeling invincible.

Before I got to the Olympics, the lead up . . . everything I did was golden. . . . I was just rocking! The PBs were coming out everywhere, and I was just flying! Went to [Spain], continued that form just so keyed up. I thought, “I’m going to take the

world by storm!” You know, it didn’t matter; no one would know me, and I had that advantage, and no one would be worried about me. I’d just come out of nowhere and just take them all apart! . . . The form that I was showing leading up, there was nothing to lose . . . it was my first senior team, and I just thought I’m just going to go and tear it apart!

Unfortunately, what he did was to tear himself apart, physically and emotionally. I identified with these feelings of invincibility. When I was training to make the Olympics for 2000, before my injury, I recall having no doubt in mind that I would stand on the Olympic podium with a medal around my neck; it had inspired me at the time, but it also made me blind to my own needs and limitations. That extreme level of motivation to perform at the Olympics, the belief that one will succeed, and having excellent physical form prior to the Games, can motivate athletes and coaches to do too much. I thought a bit more about this sense of invincibility, wondering where it comes from, how the Olympics drives athletes to delusions of grandeur and feelings of God-like stature. Perhaps feeling invincible occurs when you get ahead of yourself, fantasising about the perfect outcome before you attain it, in this case, the reward of absolute love and approval for being an Olympic champion. I remembered one of the experts from Study 1 saying that he was most concerned about athletes being at risk for overtraining when they are in peak form. He explained that athletes who have reached a new peak, or achieved recent PBs are at risk for two major reasons. First, on the physical side, to reach the peak, athletes have probably balanced their training and recovery just right, and, therefore, if they do more, they may push themselves over the edge into overtraining. Second, on the psychological side, the thrill of peak form, or new PBs, is so motivating that athletes and their coaches end up thinking, “If we can do this well with this much training, imagine how well we could do with a little more!” Listening to John’s story about preparing for his first Olympics, it seemed that both he and his coach got carried away with his excellent form.

I had qualified . . . much to everybody’s amazement including mine, had a bit of a blinder of a race, and then I dominated the rest of the selection races. But then we

did something fairly foolish leading up to [Barcelona]. We went up to altitude, and I was in really, really good form and I, foolishly, with [Coach], I guess we made a big mistake. We did too many hours at altitude. . . . I had already peaked, and we were trying for, you know, like doing a bit more training. We just pushed it too far. I was already in fantastic form. . . . I made this huge leap and just killed the other guys, and then why the hell we decided to up my training and try and reach another peak I have no idea. In hindsight, it was just stupid. . . . Why, when I'd already made such a quantum leap, had we tried to go that extra bit? . . . I was really susceptible to getting whatever virus was floating around as soon as we got to the [Olympic] Village with people from all over the world. . . . I just lost everything, all the strength, and there was nothing I could do. It was a virus that went through a few different teams, and I got smashed by it. . . . I was in the best form I've ever been in when I went down.

With hindsight, John admitted that they messed it up trying to reach a new peak when he was already in such good form. Despite being significantly ill in the week before competing, however, John proceeded to compete at the Olympics, perhaps setting up a behaviour pattern of competing with physical setbacks, which might have gone against better judgment.

I raced, but I probably shouldn't have. Yeah, I raced. Stupid. I ended up getting a Mars Bar off a photographer at the last 5 km mark to see me over the line, but I was right off the pace. Scott had a really good Olympics, and I had been knocking him off convincingly. So, he took all the glory, and I was sick, and that was my first Olympics.

As I looked over at John during the interview, describing his first Olympic experience, he appeared shaken, sad, frustrated, and even pissed off that he had got it all wrong. He could not help expressing his regret to me.

If only I had looked back and looked where I'd come from and what sort of form I was in and gone, "Well, look, you've made this huge leap! It's a stressful time. Just take it really easy leading up into the village. There's no point in doing big hours." . . . Why do people go do these stupid things? Why can't they just stand back and think? They sort of know they're doing it anyway, but they do it. I knew, and I did it, and three times I blew it.

I empathised with those feelings of regret because I had gone through a similar experience with my attempt to make the Olympics, but I still wondered why John had to mess up the Olympics twice more after that first bad experience. In the next few minutes of the interview, John really opened up to me on an emotional level, letting me glimpse the depth

of his passion for his sport, and perhaps, the depth of his possibly pathological need to succeed. On top of being sick and fatigued during his first Olympics, John discussed the humiliation he suffered for being one of the last athletes to get out of the water on the swimming leg, a discipline he was supposed to dominate, and then being one of the last athletes across the finish line.

I was about 5 metres down on [one of the last guys]. . . . I was so frustrated. . . . I got [out of the water] almost last. I was screaming inside, just yelling at myself. . . . Oh! It was shocking, and I just felt so humiliated and so embarrassed in front of the whole world. . . . As the race came to an end, I was just running for my life, basically. It was the weirdest experience; it was like one of those dreams where you can't run away from the guy that's chasing you, or you're trying catch something, and you're just running on the spot. It was almost like that feeling. . . . At the end, I crossed the line, and I was a mixture of anger and humiliation. As you cross the line at the Olympics, there are 58 TV cameras, just all-round the end, so you run across the line, and then . . . all you see is cameras. I just sort of put my head down, and I just walked past the guy who won the race, and I said that was fucking bullshit. . . . I walked past, and I had my head hung low and, like I said, I was so shattered. I didn't know what to do. I was so shattered. . . . I was sick, but [racing the way I did] just piled on the humiliation. It was like I was being crucified in front of the whole world.

It sounded like performing poorly at the Olympics was more than just disappointing for John. His words, "I was so shattered," "embarrassed," "humiliated," and "I was being crucified," conjured up images of John being tortured from within, the insatiable hunger of his narcissistic psyche driving his self-loathing for failed Olympic dreams. From delusions of grandeur, and of achieving God-like status, John had descended to images of being a crucified martyr. He had said that he held a lot of his emotion inside, but he told me that at one point, with his girlfriend, he also let it come flooding out.

One night we were lying in bed, and we were talking about stuff, and I don't think I had cried in front of her before. Oh, this night I cried my eyes out, and she was like, "What's wrong? What's wrong?" And I was like a baby, and I probably cried for an hour straight. I couldn't stop. It was like I didn't care that she was there. I didn't care that I was embarrassed. I didn't care about anything. I had to lie in the bed and cry and cry and cry. I've never cried that much, ever, and I really didn't even talk. I didn't even tell her why I was crying, I don't think. I just remember crying, and it lasted all night, but it was such a cleansing. . . . It felt good to cry, and so I just rode it all the way, I rode it all the way out of my system. I mean there's still a deep scar from that somewhere, but I can deal with it now, and I've dealt with it.

John's recollection, here, of his outpouring of emotion surrounding his first Olympic experience, made me think about how the emotional and physical trauma of competition, and the deep scars that get left behind, have effects on subsequent competitive experiences. Is an athlete, who is affected so profoundly by a sport experience, more likely than one who is not so affected, going to be at greater risk for pushing himself too hard in the future? Was John's emotional response a hint, a warning sign of things to come in the future? Were his following eight years of training and continued pursuit of Olympic gold all about trying to heal that deep scar? Was it John's attachment to fixing himself through sport that drove him to get it wrong in two more Olympic Games? John did get it right several times at the world level, but I got the feeling, despite John's comments that he had worked out what was optimal for him, that he might have got it wrong at other times besides his failed Olympic attempts. I got the feeling that when it came to overcoming his regrets, and learning from his past mistakes, John actually had not "dealt with it."

In his pursuit of Olympic glory, John had learned much. He learned about discipline and commitment. He learned about sacrifice. He learned to push himself. He learned to persevere in the face of setbacks, in the forms of fatigue, pain, injuries, and illness. He also learned about isolation, fear, and disappointment. Ultimately, he learned about failure. As mentioned previously, John admitted to learning about many things too late. During the interview, he acknowledged adopting patterns of behaviour that led him to destructive results for his body and his performance at his three consecutive Olympics. As our interview moved into discussion of John's experiences with illness and injury outside of the Olympic periods, I began to see that perhaps he was not as balanced as he portrayed himself earlier. With the Olympic dream branded onto John's mind for 15 years, John had felt compelled to block out injury, illness, and fatigue, or, at times, to push excessively after already having made significant leaps in performance. With the following comments,

John highlighted several times where he got sick, but chose to continue training or competing anyway.

I went over to World Student Games and went overseas to Europe as usual. I was in [France], and I was quite crook in [France]. I did race, but I wasn't healthy. Quite a few people got sick, but I got very sick, and then we went straight on training anyway. . . . Then we went to World Juniors . . . and I ended up racing, actually. I think I started to get better, but then I went down hill again, and I went to see the doctor and he did tests on me and said, "No. You're not starting." That was sort of the start of my illnesses. . . . After that I qualified in the first World Cup . . . and then 5 days later, I don't know why I got sick again. It was pretty bad. I got really bad migraines, headaches, and I'd just lie on the floor thinking I was dying. . . . All the doctor could say was that yeah I've got some virus. It happens to quite a few [triathletes] every season, so I should write this one off, go home, and come back next year, but I didn't really know what was wrong so I kept going. I sort of got better, but my pulse was still messed up. We used the old test, lie down and stand up and watch your recovery rate, and it was just stupid, and when I went out training long slow distances it just went through the roof, but I didn't actually feel that bad. So it was the end of [June or mid-June] I went down for a world cup in Austria and, on the first hill [of the run], I just went so lactic, the worst race of my life. I should have pulled out, but I didn't because I'd never pulled out of a race before.

The pattern evident in John's discussion of illness was that he would continue to compete despite feeling sick, and sometimes against doctors' suggestions to take time off.

Somewhere in John's development as an athlete, he had learned to keep pushing despite having an illness, something that the experts in Study 1 had pointed out as a high-risk behaviour for overtraining outcomes. I had the sense that John was going to reveal more about where he had picked up his compulsions to push through illness. I was soon to learn that John also had stories to tell about injury.

I often wonder where I could have gone if I would have had more time to train and had of been smarter in what I did. I had quite a few injuries too though. . . . I had problems with my [ankle] from over-use. I had some problem with my low back that I never really managed to isolate. Tendonitis on the left knee, which now I've got problems with . . . plus the world's dodgiest ankles and skinniest Achilles' tendons you've ever seen.

When I asked John for more detail about his injuries, he surprised me with what he said, on a number of occasions. Recalling his description of the lead-up to his first Olympics, John had mentioned that he was flying, was in peak physical form, and, although he had done

too many hours at altitude, he had said that nothing was wrong with him until he got sick at the Olympic village. Nonetheless, when we got to talking about injury, John pointed out that he had experienced problems with tendonitis in his left knee prior to his first Olympics. Memory is a beautiful thing; it forgets a lot, and I sensed I was going to observe several more instances of John's forgetful memory.

Going back a bit, just before [Barcelona], I got tendonitis in my left knee, talking about injuries. . . . So this tendonitis got to the point where it was really giving me the shits before we went to [Barcelona]. . . . I hated the thought of getting the wear and tear kind of injury so early, and that was sort of playing on my mind. I thought, "I've got chronic injury, and I'm only 22."

I saw John's omission, of this injury experience, in the first telling of his Olympic experience as support for a growing understanding I had that John may have exhibited behaviour patterns throughout his career that put him at greater risk for overtraining and injury. The behaviour patterns seemed to revolve around keeping silent about injury and illness, trying to block them out in the early stages of onset, and, generally, trying to make everything sound great when talking about his health. It was a behaviour pattern that John repeated throughout his career, and repeated again with me in our interview, at least until he began to feel more comfortable talking to me. With an interest in understanding John's attitudes toward injury, I asked John the following question, "You didn't feel that [knee injury] coming on?" His answer seemed to support my thoughts about his trying to block out the injuries, "A little bit, but I thought that can't be happening, not this early!"

With respect to other injuries, it turned out that John had to miss out on several National Championships, World Cup events, and World Championships over the years because of injury. He gave me a summary of a few of his significant injury experiences.

My back became a real issue, and as a result I got to the Nationals and couldn't really get [into the start], and my back seized up. . . . Then after that big winter of [1993] got to Nationals that summer, and I screwed my right ankle, ligament strain, screwed it and so subsequently pulled out. . . . Won the National Championships at the start of [1995] and went to Europe for an invitational [triathlon] . . . the best got invited to that and . . . again I was in really good shape, really great. . . . Then [on

the bike] I strained an abdominal muscle, like a psoas, so that put pay to my [Europe] campaign. Lying 4th and had to withdraw, so that really pissed me off.

On another occasion, John talked about how he continued to train and compete despite what seemed to be significant pain. He also admitted to keeping quiet about his pain in front of his coach, at least until the pain became too debilitating to mask.

So I'm in [the UK], I went to see this guy just to get a rub on the back. He was doing this stuff, then he sort of started contorting me, he did some rotations and sort of clunked me, and I thought, "Yeah, that killed." He said, "Look. You'll feel terrible for the rest of today and tomorrow. Neurally, you'll feel crippled. You won't be able to do anything. I would recommend you didn't train tomorrow, but after that you'll feel roses." . . . The neural stuff had settled down, but, all of a sudden, where I'd had some pain I had a real spot, like an issue right in my spine. Oh, it would take my breath away to sort of rotate on it. Anyway, I kept it under my lid a bit, didn't tell [Coach], and we travelled around did some more comps, and it was starting to really upset me. . . . I didn't want to tell [Coach] until it got to the point where I said, "Look. That chiro that I saw, whatever he did when he clunked my back, he's done something, and it's messed it up, big time." I was starting to get to the point where I couldn't [swim], couldn't [run] properly . . . couldn't do any rotation, couldn't do any impacting, which basically is everything. . . . Physios were talking, "Look. If it doesn't settle down, we can just give you an injection." So, I was like, "OK. That'll be good." So, treatment, treatment, treatment. Nothing was working on the treatment side. I was still training fully expecting to go and do World Champs. It'll be fine. Last resort, get a jab, no worries.

"Get a jab." That was something that I heard from a number of athletes, especially from Steve the footballer. John was trying to hide his injury and not communicate about it to his coach. To parallel this type of concealing reaction to injury, John had a system behind him that would help him to deal with his injury by numbing it with cortisone injections. Like with Steve, I was getting insights about the pressures within the sporting environment that might have driven John to push through injury. When it came to John's second Olympics, John responded questionably to an injury, which preceded the trials, and that response seemed to have affected his ability to perform to his potential when he got to the Games.

I just rolled my ankle over in training and had fallen like that, heard it crack. . . . I was, "Oh my god!" I thought it was broken. I heard this crunch, and I thought it was broken, and I just lay there screaming. You know, you say that your life flashes in front of you. My Olympic dreams flashed in front of me. I just thought there goes the Olympics, straight away. Gone. I'm lying on the bed, and I didn't want to look down. I was expecting to see it hanging off at an angle, and I was

screaming, and swearing, and cursing, and the coach was running around. . . . I got the courage to look down, and it was like, “OK. It’s attached.” I tried to move it, and I could move it, and it was killing me anyway. I went and I put ice straight on it. I set my alarm for every hour, had a bucket of ice next to the bed, and every hour got up, put my foot in the bucket for 15 minutes. Go to sleep, hour later, and that was for the first 48 hours; every hour for 48 hours I had ice on it, just knowing that time was my enemy at that stage. I was overloading the rehab. I was overloading it. Everything I was doing had to be accelerated. I didn’t want to waste time. I didn’t have time to get it right and then start building it up. It was just a matter of “Get it right as best you can, because you’ve got to.” I didn’t want to just go to the Olympics and just participate. That lead up period was supposed to be where you start to crunch, like in all the years gone by, that period where you lead up, you start clicking everything together. So that was eating into my period where I was supposed to be getting speed up and getting all the things to click and get ready. . . . I ended up doing the best I could rehabbing it. I ended up competing at the trials with it taped. I won the trials in not a very good [time]. I got through the trials OK. My ankle was OK. . . . How stupid was that though? . . . The [ankle sprain] was 11 weeks out, and I panicked when I shouldn’t have because my normal prep is only 8 weeks anyway, and I still had 8 weeks once it got healed.

John was feeling desperate when he hurt his ankle; his Olympic dreams flashed before his eyes. In retrospect, he acknowledged that he had adequate time after the injury healed to prepare properly for these Olympics, but at the time of the injury he could not see that clearly. That desperation about the possibility of missing another Olympics led John to panic; he might have to forego another chance to win the love and affection of the world for his athletic achievement. The perception of not having enough time, John’s sense that the injury was eating away at his preparation time, seemed to motivate him to do more than his body could handle in terms of training and rehabilitation; he ended up pushing the injury too hard and being unfit for the Olympics.

In his first two Olympics, John talked mostly about bad luck with getting sick or injured. John claimed that he was not the kind of athlete that went overboard in terms of physical training, at least in his mind, stating, “I never push myself in terms of doing the physical side, I push myself on the technical side.” Yet, John acknowledged that, eventually, he did push himself physically, in the lead up to his final Olympics.

I sort of got to the stage where it was like, “I’m just going to train!” That was the important thing, and if I hadn’t had good enough sleep, or I hadn’t eaten well

enough, it didn't matter. I was training, you know. But, I went overboard. I did too much. . . . I think, when you really get classic chronic overtraining syndrome, you're on a fine line, and you don't realise it, and then you just go bang off the edge, which is totally what I did. I went from here, getting really fit to . . . I just crashed. Walking down the beach 100 metres from my front door was an effort. I had to rest before I walked back.

I was getting a more developed picture of John and his overtraining behaviours. He originally made it sound like he had a lot of bad luck during his Olympic campaigns. He had said that he was good with injuries and illness. He had said that he knew what was optimal training for him and that he did not push himself too hard. It had become clearer that John was not just a victim of bad luck, however, as John contradicted his original statements about being good with injuries and illness, and not pushing himself too hard.

Looking back on his last Olympic campaign, John acknowledged that he been fully drawn in by the Olympic dream once more; the seductive pull of gold medals, again, had obscured his objectivity, and set in motion his single-minded pursuit of perfection. John got trapped feeling he had to do something extra, something special, when it came to the Olympics.

Oh, I just tried too hard. Yes, just didn't stick to the normal formula, went for that bit extra, you know, did things a different way, panicked when something went wrong. . . . I think the mistake people make . . . is people just look for that bit extra, or try for perfection, or try for too much. . . . I know for me, when I overtrained, at the end, leading up to Olympic trials, I basically tried to get my preparation perfect. I'd spent [ten] years, I'd been top 6 in the world. . . I'd been first, fifth, second, first, second, and I'd done every one of them on 8 weeks or less prep, and none of them had been perfect. . . . For Olympic trials I tried to have a 3-month prep. What was I thinking? I tried to do it perfectly. I tried. I'm like, "OK. For the first time in my career, I'm going to get it right. I'm going to. I'm going to have the big prep. I'm going to put in the big work." It was stupid, because it wasn't what had worked in the past. I mean I was probably better off to stuff around for everything up until the last 6 weeks and then put in the big work from then on.

John was trying to get it perfect; he mentions the word perfect four times here, but instead he ended up getting it totally wrong. John erred by looking for something extra, for something special, for something different than what had worked for him in the past. In this final attempt at the Olympics, armoured with World Championship successes,

equipped with knowledge and experiences of previous Olympics, he still wanted to change anything he could to get it *perfect*. It was to be his last dance, and he surrendered himself one more time to the Olympic seduction. He did not talk so much about his feelings of invincibility, his delusions of grandeur, in this last Olympic attempt, but he still sounded desperate to fill a void. Perhaps John could be loved, if only he could be *perfect*. He even changed coaches for his final Olympics, describing the change, however, as a desperate attempt to maintain a sense of control over his training.

I still know that if I'd been with [my first] coach I would have gone to the Olympics, but I made the choice that I didn't want to do it that way, and I only wanted myself to blame, and I wasn't happy in the training environment with him. . . I had another coach that was really good leading up to the [last] Olympics, but I didn't allow him to have control, and he was too scared to do it. Certainly everybody expected me to do well at the Olympics, but the pressure and expectations from myself were probably higher than anybody else.

It sounded to me like John was flailing in his efforts to have a sense of control over his Olympic campaign. Over the years, John's Olympic dream had transformed into more of an Olympic nightmare; he had been maimed, humiliated, and crucified. In his first Olympics, it had been all about the team of him and his coach; it had been about a shared dream of Olympic gold. In his last Olympics, John did not want to trust another coach, who might let him down again. John felt that his coach had failed him the first two Olympics, and for his third Olympics, he did not want to blame anyone but himself. He seemed to have gotten what he wanted.

Following from John's last comments about how he put pressure on himself, I looked to gain greater understanding about how John's character might have influenced his overtraining behaviours and attitudes. When I asked John about what he saw as some of the driving factors behind his behaviours, attitudes, and unfortunate overtraining experiences, he began by telling me a bit about his own personality. John admitted to

strong internal drives. He called himself a perfectionist, and he noted that he was obsessive, at times, in his approach to training.

I'm totally a perfectionist, and I'm totally obsessive, and I'm totally anal, and all that sort of stuff, but, yes I'm good. I think I can say better than I can do. Probably always have been like that because I've always been able to think very logically. . . . I mean, I can be super hard on myself, and I think at the top level you are super hard on yourself. . . . Certainly, athletes are really hard on themselves. I tend to be like most athletes who do what I've done, or what you've done, we're pretty driven in anything we do. I think that's a really good quality I have, and I think being hard on yourself drives you to be one of the best, but I think you need external people to moderate that. Like, it's OK if the athletes are really hard on themselves, as long as they've got somebody watching out for them.

The mass of contradictions continued. Just after telling me how stupid he felt for trying to get his last Olympic preparation perfect, John defends himself by saying that it is good to be self-critical, to be super hard on oneself. John did note that it is important to have other people to moderate a self-critical athlete, but when it came down to his last Olympics, John went against his own advice and shut out his coaches. This ongoing string of contradictions seemed to define John's career, and left me thinking about how competitive sport creates an environment where balance itself is a contradiction to the demands of competitive sport.

Reflecting on balance, I thought about my own experiences in rowing. On my second attempt to make the Canadian Olympic team, I felt that I knew what it took to keep my body and mind in balance, but I still got knocked out of balance. I felt completely coerced by the pressures of the high performance training environment to shut out pains and niggles, and to keep pushing, despite the voice in the back of my mind saying that I could not continue to abuse my body in the manner that I had been. I think John must have sensed my identification with his situation because he suggested on a few occasions, including twice in the previous quotation and three times in the following one, that he and I might have had similar attitudes or behaviours.

I was always my worst and still am my worst critic. I'm always harder on myself than anyone else. I don't know whether that's the same with people like me or not, or I don't know whether it's the same with *you*. . . . I guess I'm not maybe as laid

back as some people. . . . There's never enough time, I guess. I am a bit that way with everything, like I want it to happen tomorrow. . . . I never watch telly. I've always, *you're probably the same*, but bang, bang, bang, 50 million things on the go, rushing here, rushing there, 5 minutes late for everything. . . . I've never thought of myself as the best in the world. I don't think I'm some kind of sick person. I'm just me, and I'm an insecure person *like the rest of us*. I'm just a normal person, right?

Asking if things were the same with me, saying I was probably the same as him, and then saying he was an insecure person like the rest of us, John seemed to be reaching out to me. It seemed like he wanted me to normalise his situation, and say everything was OK. He had taken the blame for his failed Olympic dreams, but he wanted to share his pain. John seemed to want me to validate his normality; perhaps he wanted me to tell him that he was deserving of love, like any normal person. The funny thing for me was that I felt full of contradictions in how I responded internally to John's comments. I thought, "Yeah, I suppose we are the same in some ways, but, no, I am different. Perhaps I could be hard on myself when I was training, but I was pretty laid back sometimes. Yeah, I like to have a lot of things on the go, but surely I was more balanced than John, wasn't I? Anyway, I am not an insecure person!" All of a sudden it struck me: like John, I had my own mass of contradictions that were part of a behaviour pattern, a pattern that allowed me to keep pushing myself, despite knowledge and awareness about overtraining. The contradictions were manifestations of an inner conflict between what I knew was best for my body and what I thought would satisfy my psychic needs for approval and love, namely Olympic success. Thinking about my own situation and John's together, that we both had strong drives, moderated by reasonable knowledge about training and recovery, I returned to wondering what experiences or relationships with others might have reinforced John's contradictory behaviours, thoughts, and emotions.

Although John had a strong internal drive to achieve Olympic stardom, there seemed to be a number of people behind him who were colluding in his destructive pursuit

of Olympic gold, who trumpeted the seductive myths of Olympic success, and who taught and reinforced many of his maladaptive behaviours. The most influential people in John's athletic career seemed to be his coaches, especially the first coach who helped develop John's skills as an Olympic contender in triathlon. John talked a lot about his first coach; he really respected the coach's knowledge, drive, and skill in pushing John to his limits. John made comments, however, about his coach's attitudes to training and recovery that revealed where John might have learned his maladaptive behaviours. From the beginning, John said that this first coach had to show John the necessity of doing more work than he ever would have imagined capable of handling.

Yeah, I committed, I started April Fools day in 1990 actually and started running, and it really was a wake up call. I couldn't believe the training that he expected of me, and even then, looking back, he really took it easy on me. . . . He's told me . . . that he was very wary that if he pushed me too hard, early, that I might just say, "This is bullshit. I'm walking." . . . Training every day except Sunday, week in, week out, for an extended period over the winter. Just getting my head around that was pretty startling, and I'd go walkabout occasionally. I'd put in a few hard days of training, and then my body would be screaming, and I'd sort of think, "Oh, you can't expect me to just keep doing this all the time!" . . . This [coach] was quite intimidating back then, so I'd go on these walkabouts and then be too frightened to call him. I wouldn't call him to say that I wasn't coming. I just wouldn't come. I'd leave it for a couple of days until I'd get the call at home, and he'd inevitably speak to Mum first, and then it would come down to me. Like I said that first year he just backed off. He didn't go through me. He sort of said, "Listen. I expect you to train, even if you're sore or whatever, you've just got to get used to this kind of regime." So, that first year, I thought I was training incredibly hard, but like I said there were periods where I just couldn't hack it, but he was just one of those coaches that was just really good at making me able to handle a lot more work than you could yourself. He's a genius. He's the best [development] coach in the world for the sport and still is; nobody is anywhere near him.

Listening to John talk about his responses to training, that his body was "screaming out" and that he would choose to skip training without telling his coach, and listening to him talk about how his coach was intimidating, set off some alarm bells in my head. Watching and listening to John, at this point in the interview, I felt that he was trying to make excuses for his own perceived shortcomings, that his coach's behaviour and expectations were normal, and that John had problems because he could not always tolerate the training

that was expected of him. He makes it sound like his coach was patient and nice about everything, but the coach also appeared to have an agenda of getting John to do more work, to train through fatigue and soreness, and the coach could be quite intimidating.

It still took me years to cope with the training rigours, and once I'd got that success as well, then [coach] started to putting his foot down a bit. Once he felt like he'd hooked me, and he showed me I had potential, and I could get some good rewards out of this sport, then he'd start saying, "Well, listen. The Olympics are 2 years away. You know you have to train a lot harder than you've done there." He said that was an introduction.

It struck me here when John said that his coach "hooked" him; John seemed to want to attribute his ambition to succeed at the Olympics to someone other than himself, despite his self-professed huge internal drive. I wondered about my own ambition in rowing, and how I probably attributed a lot of my drive to my father's influence as an Olympic rower. There is no doubt in my mind that my dreams to succeed at the Olympics were shared by my father. It sounded like John's coach shared his Olympic dream, and was intent on showing John his way of achieving it, basically selling him on the hard-training path to Olympic success.

Having been a competitive athlete in several sports, I have been aware that success in sport often requires high volumes and intensities of training. Nonetheless, there seem to be subtleties in how that requirement to train hard is communicated to athletes, which can affect how athletes respond, positively or negatively, to training and recovery decisions throughout their careers. In John's case, it seemed that he had a coach who introduced him to the concept of pushing hard, but made him feel frightened to communicate about his fatigue. With respect to the coach's collusion in John's Olympic seduction, in the following comments, John hinted that the Olympic dream *was* a shared dream with his coach, and something that, originally, he and his coach kept as a secret.

We kept it a bit of secret, and he didn't tell anyone, but he had the feeling that I could make the Olympic team in [1992]. I'd been gung ho; I thought I could too. Nothing was going to stop me. . . . [1991] was the first winter that I really put in. I

thought, “Yeah!” because like I said [Coach] had mentioned to me, “Look, between you and me, I think you can make Olympic squad.” So, [1991] I really put in as hard as I could and, yeah, it paid off in [1992], and I made the team.

It sounded like a lovely little secret, like one that might be shared between a father and a son. When John got sick at his first Olympics, his coach was supportive, like a protective parent looking after his naïve, sickly son. In the following remarks, John referred to the Olympic dream again as a dream that “we,” he and his coach, had.

[Coach] was trying to keep me up, “Don’t worry. You’ll be fine. You’ve done all the hard work.” But I could see in his eyes that he knew, and I was still sort of young and a bit naïve, and I deep down knew that . . . I was not going to achieve that long-shot dream that we had.

Up to this point, John had given me the sense that his coach had been understanding, albeit demanding, with respect to training commitment and intensity. It did not take too much longer, however, until I saw the origins of some of John’s maladaptive responses to injury and fatigue, and these behaviours seemed to have been learned from his coach.

Well I probably didn’t tell [Coach] about the injuries. I might have told a physio in passing that my knee was a bit sore. Yeah, that’s one of the drawbacks with [Coach]; he couldn’t deal with injuries very well. . . . Well, he’d just get disappointed. He looked like a kid who’d dropped his boiled lollies you know. He’d get so down. He wasn’t ever down at you. He wouldn’t get angry at you, but you’d see him drop his bundle. He’d be just as upset as you.

I took note here of John’s description of his coach as one who would react to John’s injuries like a disappointed kid. These comments about his coach seemed to be in contrast to those about his coach being intimidating. It made me think about how this dynamic would have affected John. I imagine it would have been confusing for John, on the one hand to be frightened of his coach, and on the other hand to see the coach act like an upset child. Like a child given the burden of a parent’s anxieties, John was left to deal with his coach’s child-like responses to injury, and the guilt-trip the coach was putting on. I can see how it would have led to John keeping quiet about small injuries and niggles. John went on

to express his desire for a supportive coach, while acknowledging his coach's maladaptive attitude to niggles and injuries.

You want someone to say, "Look man, it's alright. You're going well. We'll get around this." Although, that's not with niggles. Niggles he'd say, "Look. You live with niggles. That's what we do." But if I'd come to him and say, "Look. I've done something. I think my hammy feels tight," he'd be like, "Oh, shit!" Anyway, I probably gave him more grief with injuries than he's ever had with any other athlete, so it probably didn't help matters at all.

It seemed that the result of the coach's attitude towards John's injuries was that John blamed himself for giving his coach grief, not unlike a child blaming himself for his father's unhappiness. In the following quote, John blames his own physiology for being problematic with respect to injury susceptibility, rather than identifying maladaptive practices as causing the injuries.

I don't think my body type was great for [triathlon], for the rigours of it. So that was one issue that I had with [Coach] . . . I gave him grief . . . but my knee was kaput in [1994]. Again, I was just so shattered, I thought, "Now I'm finished." . . . I did, for that moment. I sat up on the hill, and again I just cried, and I thought, "This is fucked. I hate this sport. I'm crippled at 24."

So, here, John is feeling *shattered* again. The dream that was supposed to fill John's void, his yearning for love and acceptance, turned out to be a bitter pill, an experience that left him shattered and crippled. Those words, "I'm crippled," echoed in my head; I had probably felt the same about some of the injuries I experienced in my sports over the years. I also had fought those feelings of being crippled several times, choosing to chase the Olympic dream despite thinking my career was over, and then getting seriously injured again. The seduction of the Olympics promised so much to athletes, but brought with it so much pain.

Looking at his relationship to his coach, and how John had dealt with injury and fatigue throughout his career, it appeared that John had internalised his coach's attitudes. He had learned to react to physical setbacks, such as injury or illness, like a child who just wants to block them out, denying the consequences. At the time of the interview, John was

still training and competing, but had changed coaches. I queried him about his new coach's approach to injury.

S: How has he been in terms of the injury stuff compared to your other coach?

J: Great. He sort of, he gets stuck into me as well. He calls me a pussy and all that sort of thing for breaking apart, but that's all tongue in cheek. Under all that banter he is really positive, and he will take you aside and say, "Look, you know you are OK. Don't worry about it." And, to me, it made a huge difference, so he's been really good with that. Like I said, he calls me a pussy and all the rest of it.

Here, John says that his new coach is great about injury, although he calls John a "pussy", something that John mentions twice, despite saying his coach is joking about it. Perhaps, the coach likes to joke around with John, but given John's past experiences with coaches and attitudes toward injury, I imagine that John might still have felt compelled, with this coach, to keep silent about pain, fatigue, or other niggles. I think that the following dialogue, between John and me, illustrates how John had internalised maladaptive attitudes toward injury.

S: How has this last year been then in training?

J: Awesome, best I've ever done, the best! I'm stronger and fitter than I've ever been.

S: Any injuries?

J: Yeah I just tore my calf 10 days ago. . . . It turned out to be overload issues, like my calves were really tight from just doing a heap of running. They'd been tight all year, but these were particularly tight this week. [While running] I felt a bit of a pinch in my calf, or just underneath my calf, didn't really think much of it. I kept [running], and it was hurting a little bit, kept [running]. The next couple of days it was still hurting. Got to the point where I tried to run on last Saturday . . . and felt something sort of pull a little bit. So, from then I've just been rehabilitating and strengthening and but that's really been the only major thing. I've had little niggles here and there.

In the previous exchange, I could not avoid searching for contradictions in what John had said. He said he felt awesome, fittest he has ever been, and a moment later he admits that he just tore a calf muscle. I was affected, I think, because I recognised attitudes and behaviours that I had seen many times in teammates and in myself throughout my athletic

career. We are capable of deluding ourselves, thinking everything is great when it is not. It made me think that perhaps many athletes are programmed to give the impression that they feel good even when they are not necessarily healthy, a must-always-be-positive-approach to life. Furthermore, John hinted that he still engaged in typical overtraining behaviours. Despite feeling pain and tightness in his calf, he continued to train until the niggle escalated to a more serious injury.

At this point in the interview, I could see that John had been strongly influenced by his first coach, internalising maladaptive attitudes to training, recovery, injury, and illness. I guessed that such attitudes, and associated overtraining behaviours, were likely to be transferred to relationships with subsequent coaches. I had a picture of John, a motivated individual, a self-proclaimed perfectionist, having had early experiences with a hard-driving coach, who did not like to talk about injuries. I had a sense, however, that there were other pressures, perhaps from other people, that reinforced John's relentless pursuit of Olympic glory. Talking about the sport of triathlon, John indicated that there are certain cultural expectations, and even stereotypical slogans within the sport, that support the *more is better* approach to training.

I mean particularly in a sport like [triathlon] where it's tough, I mean, you are talking about people who by nature have to be quite obsessive. . . . It's a working person's sport. You have to do the work. It doesn't matter how talented you are. You know there is just no way around it, no other thing than to do the work, but you almost push to do the work without rest. You give up recovering. . . . One of the mantras in [triathlon] is *rest is for the dead*.

Surrounded by such cultural imperatives, I can imagine how it became difficult for John to make balanced decisions about training and recovery. In my own experience, returning to train with the National rowing team for a second time, equipped with overtraining research knowledge, I still found it difficult to manage my stress/recovery balance because of the, often unspoken, pressures I felt in a tough training culture. For John, those sport-culture pressures were mixed with positive feedback from others and feelings of national pride, a

potent combination of fear and inspiration. Making his first Olympic team, John said that he loved the feeling of surprising everyone.

Qualified for the Olympics . . . so was thrilled with that. Deep down we knew that we could do it and, when we pulled it off, it was great and the whole [triathlon] world couldn't believe it. They were just like, "Where did this kid come from? How did he do it?" People were really impressed and all the rest of it.

John was rewarded with recognition; people were impressed, and perhaps John was getting the love he so much desired. When he finally got to the start line at the Olympics, despite having been quite sick in the lead up to the competition, John was totally fired up by feelings of pride for his country.

I knew I was flying before the Olympics . . . and when I got to the Games, I thought, you don't need any motivation. . . . When I walked out in front of the crowd and just to know I was in the Australian colours, I was so pumped up. That's probably why I was so shattered about everything, because I'd never been prouder. I could never have felt that proud, and I don't think I still ever have felt that proud since. Getting to [the start] . . . I was so aggressive. I remember because . . . my training partner, we were lined up basically in a row, and we were like high-fiving, and we were like hugging and screaming at each other. Come on! Let's just tear them apart! Let's just take them apart! We were so pumped.

Is this scenario not what every athlete dreams about, representing one's country at the Olympics? It had been John's dream. It had been my dream. Who wouldn't be seduced? The irony here with respect to overtraining, however, was that John really was not ready to tear the world apart. He had been seriously ill for the preceding week, and was not physically ready to compete at the top level. Yet, in the heat of the moment, he got carried away in a bubble of Olympic fantasies, believing, momentarily, that he was invincible, the delusions of grandeur creeping up again. Dangerous thoughts. With the contradictions between injury and invincibility staring me in the face, I asked John about what he might have changed about these first Olympics, if he could do it again.

S: How was your lead up? Would you have changed anything looking back now?

J: No. I couldn't have. No way. It was just bad luck. . . . There couldn't have been anything I could have done differently. . . . I wasn't even thinking of holding back. . . . I was going to go to the Olympics and then take another big step forward. It

wasn't even, you know, bide your time, wait, wait, wait, get ready and then peak. It was like, I was still peaking all the way up.

John's answer to my questions astounded me. Earlier in the interview, he had told me how his preparation had been great, but he had probably done too many hours at altitude that could have made him vulnerable to getting sick. Then a little later, he recalled that he also had experienced a relatively serious knee injury, in the form of tendonitis, prior to the Games. Nonetheless, responding to my probing questions about his Olympic experience again, John selectively blocks out those significant setbacks, and claims that he just had bad luck. The power of John's denial was overwhelming.

As the interview was coming to a close, John offered me one last peek into his fragile psyche, a peek that left me questioning the purpose of competitive sport, despite me loving it so much. Talking about a back injury in the following quote, John pleads with everyone to *fix* it, but he really came across as pleading for someone to fix him and all his shattered dreams.

That was the worst part about that trip because there was one spot in my back that I could point to all the time say, "Look guys. There it is. Look, it's on that little joint there. Get it!" They'd try hammering that spot, then they'd try leaving it alone and hammering everything else around it. They tried taping it. They'd tape my ribs and back. Everything they did didn't work. That was the worst thing, because, like I said, my mindset's always, "I'm competing. I am really ready." I knew I was in good shape, trained hard. I was going to do well at the World Champs, but the longer it drew on and the closer you got, the more I was thinking, "Come on. This is starting to get more serious. OK, this is more serious now. Now, come on. Oh no! Shit! What's going on here? Look, they still can't fix it! What's going on? My training is suffering! It is just a niggle. It will be fixed. They'll fix me!" I made a decision to go to [Germany] to get treatment by the people that I trust and know. They will fix me. I had no doubts, but like I said the closer it drew to getting there, the more the doubts were creeping in and the more realisation I had that it's not fixing. Nothing they do is fixing it! . . . I was really disappointed I didn't make the world championships, but by then I'd exhausted every avenue. I'd given it absolutely everything, so I wasn't shattered, because the closer I drew to it the more I thought, "This has got to work this time! No it doesn't. No it doesn't. No it doesn't." It was like shooting a lame dog, you know; you had to put it down. So, to finish it, I went into the manager and I said, "Look, you know you can't fix me. No one can fix me. That's it."

“No one can fix me;” perhaps that was the final message about the dance with Olympic seduction. Some athletes look to this glorified event, staged in front of the world, as the solution to all their insecurities, as the ultimate goal that will bring them happiness in life, or that fills the void of existential angst, or as the cure to heal their internal wounds, or as the one thing that will fix them. The athletes are misled, however, because sport is not there to fix them. For John, as long as he used sport as a vehicle to compensate for his own feelings of inadequacy, he seemed destined to be disappointed. Ironically, even after all of these discussions and insights about the Olympics, as I looked over at John, I realised I would always love the Olympics. Despite everything that we had talked about, I still wanted to defend the glory of the Games, and, perhaps, so did John. Perhaps neither one of us was ready to give up all of our contradictory behaviours and attitudes, although, at least, we had become more aware of them at the end of our conversation. I also realised the powerful seduction of Olympic greatness would probably continue to prompt athletes to surrender their better judgment about what is best for them, and to overtrain. Nonetheless, I had the hope that by sharing our stories of destroyed bodies and crushed dreams, we might help other athletes to find better balances in their lives, at least some of the time, perhaps to be more accepting of themselves, and to see that they do not need, nor can they, be fixed by competitive sport.

The Overtrainer: The Story of Jane

When I think about Jane, I reflect back on one of the perceptions that I held at the outset of this research about athletes who overtrain; I had the impression that there might be a specific type of athlete who would fit into a category of *overtrainer*. Steve and John both had elements of that persona, but neither of them characterised it entirely. Jane, however, seemed to fit into that identity *perfectly*. She was what I had imagined an overtraining athlete would be like: she appeared to believe, unequivocally, that *more is*

better. She *hated* rest days. She responded to slumps, or any types of plateaus in performance, with increased training efforts. She completely went into denial about the consequences of injury, trying to block out awareness for parts of her own body. She did not want to listen to advice from others regarding recovery, and, she constantly lived with the sense of not having done enough. Jane seemed to epitomise what it meant to overtrain; it was almost as if one might be able to isolate an overtraining gene in Jane's DNA.

Nonetheless, I sensed that there had to be origins and explanations for Jane's traits and behaviours from within her ontogenetic history. As Jane took me through her athletic career, which she was trying to rejuvenate after a crippling struggle with chronic fatigue, I learned that her overtraining had started at a young age, and had been driven by abusive coaches and a pushy, over-involved mother. Her story is one of an athlete exposed early to the pressures of competitive sport, a young athlete completely trusting her coaches to take care of her needs, who resorted to overtraining in attempts to keep her coaches and her Mum happy, and to win their love and attention.

As a child in competitive gymnastics, Jane absorbed the maladaptive attitudes and behaviours of her coaches, to the point that she internalised them, and they became part of her disposition, manifesting themselves in later sports and training environments. With a debilitating injury and a changing body in her early teens, Jane found herself not fitting into gymnastics anymore. Choosing to follow in her Mum's footsteps, Jane took up the sport of track cycling. Here, her first cycling coach recklessly pressured Jane to *thrash* her body, teaching her that overtraining was the way to achieve success. Jane eventually left this coach, having been offered a scholarship to one of the Australian sports institutes. At the institute, she had new coaches with, seemingly, more positive attitudes, but who still reinforced her maladaptive training behaviours. Toward the end of her career, Jane managed to work with a coach who appeared to have a balanced approach to training and

recovery. This last coach tried to dissuade Jane from her excessive behaviours, but by this time in her development, Jane could not get away from herself, from her internalised slave driver. Like Steve's and John's stories, Jane's tale made me sad, but even more so, it made me angry. Jane's story was good justification for people to denigrate competitive sport, to point out that competitive sport can be equivalent to child-abuse. I have maintained my faith in the *goodness* of competitive sport, and here was a significant challenge to that faith. I took a deep breath and tried to relax, knowing that the next few hours with Jane would be challenging, possibly quite upsetting, but in the end, fascinating.

Over the next couple of hours with Jane, I listened intently to the tale of how one develops an overtraining disposition. I listened to Jane's descriptions of abusive practices meted out by her coaches. I heard details of horrific injuries and of even more horrific responses to those injuries. I learned how Jane used dieting and weight control to win approval, and to gain a sense of control over her body. I saw how overtraining, for Jane, became a vehicle of distraction from loneliness, from the emptiness she felt in her life.

At the start of the interview, Jane identified herself as someone who overtrains. She seemed to be proud of that identity, proud of being able to push herself when she was in excruciating pain, or when she was overwhelmingly fatigued. I wondered if she was looking for approval from me for her overtraining identity, perhaps similar to the way she looked to coaches for approval for pushing herself excessively. She came right out and announced that she was the kind of person who liked to *thrash* herself.

I don't believe in taking the easy road. I don't know the line. I'm a lot harder on myself, I think, than most athletes. You know there is the line where it hurts and you sort of go, "OK, I'll stop now." I push through a lot more injury stuff and fatigue than probably most people would or should. . . . I am much harder on myself. . . . If I do something, I want to make sure that I am the best that I could possibly be at that. It's not a competition against other people. It's purely a competition against myself, and I walk away thinking, "I could have done that better." If I pulled out and took the easy road, then I will cane myself in some other way. . . . I mean, I am more motivated to go for a [ride] in 40-degree heat than in 30-degree heat. Explain that. That's totally weird. . . . It's a mental battle with

yourself to overcome everything. You just say, “I’m not going to let this stop me from doing what I want to do!” That’s exactly the same as when you’re a bit sore; you just think, “That’s OK. I’ll just get over it.” I push through more than most people, but that’s probably habit from when I was younger.

Here, Jane seemed to revel in the identity of being a perfectionist who overtrains. Although she acknowledged that she probably pushed herself too hard, she places herself above other athletes, suggesting that somehow she is tougher than they are, more motivated than they are. Thinking about Jane’s identification with being a *tough* athlete, I wondered about what psychical or emotional needs she was looking to fill by being tougher than others. Jane did drop a big hint about the origins of some of her behaviours, beliefs, and attitudes when she commented that these were habits from when she was younger. I was left wondering about the experiences she had as a young athlete, and I was intrigued to hear more of her story.

Jane and I talked more about her *tough* attitudes and behaviours. Not only did Jane pride herself on doing extra training, she also admitted to loathing recovery.

You know, taking rest days, it’s sort of not an issue; you just don’t do it. . . . I hate weekends. Weekends are the worst because everyone is meant to have Sundays off, and I am kind of like, “Damn it! Why do I feel this way?” I hate it. . . . That’s the biggest thing I’ve got to change, my attitude toward rest. I am hopeless. I never have recovery time. I just think, “If I just keep doing more, it’s got to help,” but I have got to stop that. . . . Whilst you are in it . . . it seems it’s the right thing to do because you just want more, and more, of that thing that’s going to make you better, but you don’t understand.

Jane wanted more of that *thing*; I wondered what that coveted *thing* was all about for Jane. I could not imagine that it was only about doing more training for training’s sake, or even about getting better in her sport. Thinking about my own experiences of overtraining in sport, the *thing* for me was about the love, pride, and status that I had fantasised ultimate success in sport would bring me, and I believed that training harder was the way to achieve these outcomes. I was not sure if this was similar for Jane, but I sensed that Jane’s

underlying, motivations to overtrain might have some similar origins to my own. We continued on with our discussions of Jane's overtraining experiences.

In addition to pushing her training to excessive levels, and avoiding adequate recovery, Jane admitted to having maladaptive responses to injury, illness, and performance slumps.

My response to injury was to work harder, train harder, which has the opposite effect. . . . You are actually making things worse, but I didn't realise that at the time. All I knew how to do was, "I'm not going well. Work harder!" . . . I always do that little extra bit, but I never told the coaches that I'd do it. I never said that I did this and that. . . . When I had [mononucleosis] in year 7, I never told them that I was really tired. I'd just be grumpy, and in pain, and, eventually, got to the point where I just trained through my whole [mononucleosis]. Any performance slump for me was a sign to work harder. That was my response to a performance slump: work harder.

Here, Jane's responses to injuries and performance slumps sounded defiant. She was going to train, and no one could stop her! Her responses also had elements of denial in them. She seemed to think, if she could just keep training, then she might be able to block out the consequences of injury. Along these lines, Jane offered me an example of a time when she had been seriously injured from a cycling crash, but continued to train and compete, nonetheless.

My response was that, while my kidney was actually bleeding, while I was urinating blood, and everything, I backed off, because I didn't really have a choice; I was just too sick. The minute the contusion settled, against all outside advice and pressures, I just got straight back into it, and was still, I mean, obviously, in retrospect, I was not ready to train, but I thought I was. I not only was training, but I was competing, and I think that was not good. . . . But, you don't want to stop, and, as far as niggling type of injuries, I think that's part of the problem. I became so good at disassociation from the pain that I could never really get a handle on what was niggly and what was really disastrous. I ended up being able to block it out. As soon as I started thinking about it, unless it was actually like a broken leg and in a cast, then it wasn't significant. It just got wiped out.

As I was listening to Jane talk about her drive to do extra training, to push through pain and injury, and to avoid recovery, it was almost as if I could also hear a small voice of protestation, saying something like, "But I know better. I shouldn't keep doing these

harmful things to myself.” I had heard the same voice in my head, and my reluctant identification with Jane began to frighten me. There is nothing quite so unnerving as hearing parts of one’s own pathological history echoed in the words of another. At the time of our interview, Jane seemed to have reached a point in her development where she had been educated enough in sport science to *know better*. She had made enough mistakes from which to learn, and she had a pretty good idea of what was right for her body in terms of training and recovery. Nonetheless, she was constantly battling with herself, fighting some internal struggle to tame a pathogenic drive to excessive training and self-harm. It seemed that her way of coping with that internal struggle was to cut herself off from the elements causing the conflict, to deny or downplay the consequences of her excessive training, and to block out the realities of her injuries and other setbacks.

Jane’s maladaptive attitudes to injury were manifested in many ways. In the following example, Jane illustrates how she had downplayed the severity of injuries, and attempted to mask the pain with drugs, so that she could continue to do her sport.

I landed directly on my sacrum, and the [track] was really hard, and I just smashed my sacrum, and prolapsed two discs. It was a compaction injury. It just went bang! My response to that was unbelievably glib. . . I couldn’t sit down, and I couldn’t lie down. I could kneel. . . . However, I decided that I had a periosteal bruise because I’ve had periosteal bruises before, and they’re as painful as fractures, and so that’s what I decided I had. I went down to the local hospital, and there wasn’t a doctor there, and they said, “Do you want us to call one?” I said, “No, just give me something because I’ve got to get to a [race].” So, they gave me painkillers, and I just dosed myself out.

I knew I was a mess, . . . but I knew that, if I’d sat down and thought about it, logically, I wouldn’t have been able to do it. I just so badly wanted to keep going that I just tried to say, “No, no, it’ll be fine; it’ll be fine.” . . . because it’s, you know, your dream. . . . So, with the injury, I just tried to ignore it. I ignored it, and didn’t look after it, and, come trials, I had problems lifting my legs.

In this description of a crippling injury, Jane talked about making her own diagnosis, one that minimised, at least in her mind, the potential damage of the injury, and allowed her to continue training and competing. Jane also admitted to ignoring the advice of her doctors, believing that they were likely to tell her to take more rest than she believed she needed.

I used to think about medicos: if you did what they said, you'd never get out of bed. You know what I mean? I used to have that feeling that they always tell you to take more time off than you needed. Everybody is always overreacting. That might've been me. That might have just been my attitude towards external control, and I had high personal control needs. So, when you've got somebody telling me to go to bed, they might as well tell me to shoot myself in the head; that is where I will just atrophy. . . . It's a horrible thought.

Jane created quite a powerful picture here, equating bed rest with suicide. Once again, I was left wondering about the origins of such strong emotions. At this point, Jane offered me a piece of the puzzle. She gave me a glimmer that some of her maladaptive responses to injuries, illnesses, and fatigue, were part of coping mechanisms learned as a child, which she had engaged in when she was young to deal with a debilitating illness.

I had a serious immune deficient problem when I was young, and my quality of life was very good because I never said die, and because I kept my spirits up and everything. I didn't have the consequences, socially, of chronic illness because I would die in private, and I'd be up around others. I could switch off, and I think I became very good at that.

In this example of coping with an immune deficient problem, it seemed that Jane believed she could will herself better. Perhaps, the fear of being debilitated by illness was so overwhelming that Jane's only way to cope was by cutting herself off from it, or at least by pretending to others that she was okay. Perhaps, her parents also reinforced Jane's silence and blocking out of the pain by rewarding Jane for being a positive, happy girl. Perhaps, Jane learned that being tough and independent were the ways to win more love from Mum and Dad. In her next comments, Jane repeated her dislike for being dependent on others.

When it came to my injuries, with the kidney and the ribs, I very much didn't want to feel any dependency on anybody. I just wanted to be on my own, do my stuff, get on with life, and, of course, being stuck in bed is not conducive to doing that. You get to lie there and think about everything. I think I was trying to avoid the situations where I would be lying in bed doing nothing, relying on other people, and thinking about everything.

This is the third time Jane has talked about being afraid of being stuck in bed. It seemed like her early experiences with being ill and incapacitated had been so frightening to Jane that she would do anything to avoid future experiences that resembled her childhood

illness. It seemed that Jane's antidote for this fear of being incapacitated was to do anything to maintain her identity as a healthy, hard-working athlete, including training through illness, injury, and debilitating fatigue. Eventually, Jane used training as a way to escape, not only from fears of being sick or injured, but also from fears that her life was empty and meaningless.

I came here just for [cycling]. I put so much heat on throwing myself into [cycling] to distract myself from the rest of my life, and going, "Oh well, I'm not that happy. It's a bit lonely." You know, I don't have many other things; so I was overtraining myself, you know, with my coach having to say, "Back off." . . . I think I just wanted to do what I do. I can't put it more simply than that. I wanted my life just to keep going, and I'm good at what I do, and I just wanted to do it. So, I was just completely ignoring, not only everything everybody said to me, but I was totally ignoring my body. . . . That's my nature, in terms of training, to distract myself and take my mind off things. So, I fell into that trap myself, not from any pressure outside, other than me saying, "Oh well, at least it will take my mind off how bad other stuff might be."

That's probably going to be the hardest thing for me to change, just getting back to training because I love it, and not because it's a distraction from my life.

I must have been wide-eyed as I listened to Jane talking about using training as a distraction from the rest of her life. It sounded awful, painful, and depressing. I have often heard myself say to others that training is a great way to meditate, to process the stressors in my life, and to let go of them, but I do not think I have looked to training to forget about my life. Earlier, I had speculated that Jane used sport to fill a void. From this segment of the interview, it seemed like Jane had been grasping onto her sport as if it was the *only* thing that could make her feel okay. Unfortunately, this unhealthy attachment to sport was manifested in all kinds of damaging behaviours and activities.

In addition to an obsessive focus on training, another one of Jane's desperate attempts at controlling her life and winning approval was manifested in extreme dieting. At 15, Jane got caught up thinking she would be faster on the bike if she could increase her power to weight ratio by dropping weight. It was behaviour for which, in her last year as a gymnast, she had been rewarded with praise and recognition.

I'd never been that disciplined before, and I was really, really pleased with my effort, and, you know, when I lost 8kg, everyone noticed, and I think that really made me keen. . . . People really recognised your work. Obviously, it can't just fall off; you have to really do some work to do that, and it is really another way that people can recognise how hard you worked. . . . It was extreme dieting, but it worked beautifully! I felt like I was asserting myself, athletically. When all the other athletes sort of dwindled off, and didn't do anything for the rest of their seasons, well I'd really re-directed my efforts, and, you know, done something good about it. I think that's important when you are working that hard. People say, "Hey!" You want people to notice that you are doing good work.

Jane had turned to weight loss as a gymnast to win approval, to get recognised, and to be loved. She said that the extreme dieting had worked *beautifully*, and people noticed her. Three times she commented that weight loss was a way for people to recognise her hard work. She seemed very driven to gain this recognition; I wondered about what happened to Jane when people did not recognise her hard work.

In the case of her dieting behaviours, the praise and reward for the weight loss were temporary. The behaviour became problematic when Jane tried desperately, as a cyclist, to repeat the positive feelings and perceived positive outcomes generated from that first experience with weight loss. With Jane's changing body as an adolescent, and her transition to track cycling, the pressure to diet and keep skin folds low negatively affected Jane's fatigue levels and performance.

In subsequent years, when I'd try to diet, [while cycling], . . . as I lost weight, my performance would really drop. I was never totally successful in [losing that kind of] weight again because every time I lost weight, or was really focussing on dropping weight, my performance would just really drop. It got to a point where I was so tired that I started to question everything about [cycling]. I guess, with the eating thing . . . it was to get approval when I was [at the institute]. I suppose it was, continually, to show that I was good enough.

Jane was trying to engage in the same behaviours, which had worked previously to win love and approval from people around her. It sounded like her attempts to win love by dieting were counterproductive, however, because her performance suffered when she tried to control her eating. Coaches would only love her if she were performing well. Her

cycling coaches at the Institute, however, did not see the weight loss as undesirable, despite Jane's decreasing performance, and pushed her further to bring her weight down.

The coaches were constantly saying, "Lose weight, lose weight," even though I was the smallest one there. They just wanted me to continually lose weight, so I stopped eating, altogether, and lost a lot of weight. No one, not one person even took into consideration why I had lost so much weight. They didn't even say, "Hang on, what's going on?" Which I thought was really strange, because, when I came home, all my friends, and family, and athletes that I train with here, they just go, "Oh my God." Whereas, [the institute staff] didn't even come up to me and confront me.

I could imagine how debilitating Jane's disordered eating must have been. She participated in a sport that demands high levels of energy output; cycling requires athletes to ingest high-calorie diets. Without eating enough food, Jane would have struggled enormously with sustained training efforts. It seems incredible to me that the coaches kept pushing Jane to lose weight in the face of her decreasing performance. The end result of Jane's weight control behaviours was that she could not perform at all, or continue to train at any proficient level.

When I was dieting, I couldn't concentrate, and I didn't have enough energy to train well, and so it didn't really matter how light I was, you know; it wouldn't make any difference because I wouldn't be able to [train] well. . . . Well, probably for about 6 months, I was struggling more than usual, but you know I was dieting. I was used to being tired, and I was training harder, so I was used to being tired.

Jane had been allowed to continue on her destructive path within an environment supposedly designed to support athletes, and to provide them with guidance and knowledge about health, training, and recovery. How could the coaches not link her poor performances to her dieting behaviours and weight loss? Perhaps, Jane kept a lot of information from her coaches, but I was still left wondering why they did not investigate the reasons behind her declining performance.

At this point in the interview, I thought we were ready to delve further into Jane's story, to examine her relationships with coaches and parents, and to get her reflections on being a competitive athlete most of her life. Having been introduced to Jane's pathogenic

behavioural tendencies, with respect to training and recovery, and been given a few hints about some of the possible origins of her behaviours, I was eager to gain more insight into what had got Jane to her current state.

Similar to both Steve and John, Jane had tremendous success at a young age. She had been swept up into the system of sports institutes within Australia, where she was showered with praise, promise, scholarships, expectations, and pressures.

I was 4 doing gym until when I was 12, and I was State Champion in gym and bars. . . . I competed for Australia . . . 8 till 10, winning Pan Pacific games . . . and then [junior] World's, but at age 12 broke my arm, so was forced out of gym due to injury and started [track cycling]. . . . I followed in Mum's footsteps . . . when I was 12. . . . [cycling] took off and, within 3 weeks, I was State Champion, 3 months Australian [junior] Champion. I was Australian [junior] Champ for years 12 to 14. . . . I was asked to go the [institute] when I was 13. Then . . . after a few down years . . . I was Australian [under-17] Champion for [Olympic sprints and pursuit]. . . . I won an international event at 17. . . . I made the youngest ever, my only claim to fame, Australian Open [track cycling] team at age 17 or 18 or something and I was training morning and night. Then, with missing Atlanta by 3 [seconds], everyone realised that maybe I was good enough to go to Sydney.

Reflecting on her time at one of the institutes of sport, Jane recalled feeling a lot of pressure and expectation, especially given her meteoric success as a junior.

I had always gone to [the institute] with such high expectations, after being ranked so well as a junior, and I was just, automatically, going to make this magic transition from junior to senior, and take over the top spot. When it didn't happen right away, all of a sudden they were going, "Oh well, maybe she's a dud." They were kind of rethinking, changing their minds. . . . I mean, going to [the institute] was good, but there was a lot more pressure on scholarships, which I hadn't had before. So, constantly, if I wasn't [achieving certain performance levels], I had the heat on me. There was also a lot more pressure on weight, skin folds, all that kind of stuff, which wasn't enjoyable.

Jane wanted *magic* to happen, and there did not seem to be any room for failing, or even faltering. When Jane did not live up to the expectations of her scholarship coaches at the Institute, she believed that they did not have faith in her capabilities any more. Given Jane's harsh internal critic, I was not sure if her perceptions of her coaches were reflective of reality, or whether her coaches really did treat her poorly when she did not perform

well. Nevertheless, Jane seemed convinced that being loved and accepted by her coaches was contingent on her level of success in her sport.

At the start, I came and the coaches loved me, and I was the best, you know, the next hot thing, and then as performance dropped, all of a sudden, I wasn't so great, and they weren't so interested anymore. It's a real bandwagon thing at the [institute]; they jump on and off like anything. I was out of favour when I hadn't come on within a year. When I hadn't automatically made World Champs, or Commonwealths, or performed, they didn't want a bar of me. So, I'm pretty sensitive to that; I am aware of what's going on.

Jane was sensitive to being out of favour, to suffering neglect from her coaches, and to feeling uncared for and unloved. Given Jane's massive attachment to her athletic identity, it made sense that she was so sensitive. Nonetheless, I had to ask myself again, Was Jane overreacting to her coaches, or were they really that harsh on her? On the one hand, having consulted with athletes in a number of different sports, within a sport psychology context, I have seen athletes who are hypersensitive to coaches' behaviours. Such athletes are likely to take almost any critical comments made by a coach as personal attacks, even when coaches do not intend them to be that way. On the other hand, I have also witnessed several coaches dish out harsh, derogatory, and isolating criticism to athletes. In the end, it does not matter what the coaches actually did or said. We were looking at Jane's world.

Jane talked about her first, long-time gymnastics coach, "Matt," with fondness. She did not identify his style as pushing her to overtrain. Rather, she recalled that Matt babied her, perhaps taking care of her too much, in a way that she did not develop knowledge about what was best for her body. Jane also did not learn to think for herself.

Oh, he was awesome. . . . I got attention all the time, and did not have to think very independently, not having to self-analyse what was going on, you know, what's the best thing to do? I was babied, which was great at the time, because I was looked after really well. This is why I think [Matt] was so good. He never really asked me if I was tired or hurting, but he could tell when I was irritated or a bit pissed off.

Jane appeared to have idolised (and possibly, idealised) Matt. With Matt, she received a lot of attention, and I imagine, a lot of care and love. Nonetheless, I felt that despite all of her

praise for Matt, Jane might have a few negative things to say about him as well. That Matt did not ask Jane about being tired was my first clue that things with him were not always so *awesome*. Perhaps he did not want to know about any of Jane's physical complaints. In the following quote Jane says that Matt and she were the *perfect* team. It sounded like she might even have perceived their relationship, on an unconscious level, as that of a perfect, loving couple, or perhaps of a perfect father-daughter union. Her relationship with Matt deteriorated, however, not long before the end of Jane's gymnastics career.

[Matt] and I were so, so close between ages [8 to 11]. He was so good to me, and we just got on perfect, a perfect team, the two of us. Then . . . to this day, I still don't know what happened. When I was 12, we just started fighting and arguing, and I'd get kicked out of training, and he just wasn't coaching me how he used to. I think he had personal problems; maybe something happened in the family. He never talked about anything. It really hurt me. So, um, yeah, and I just wasn't getting any training done because I just kept getting kicked out of the [gym]. . . . We just didn't get on at the time. It's like how parents don't get on with kids.

Listening to the demise of Jane's relationship with Matt, I got the sense that she had been putting Matt on a pedestal, fantasising how great he had been to her, but the reality sounded like it might have been different. Jane revealed that Matt was not very communicative; instead of working things out with Jane when tensions arose, Matt chose to kick her out of training. I took note when Jane suggested her interaction with Matt was similar to a parent-child interaction. I sensed that Jane was looking to her coach to fill the role of a loving parent, perhaps a role neglected by one or both of her own parents, and when the coach deviated from Jane's idealised image of the perfect parent, she was devastated.

When I asked Jane to expand further on what happened with Matt, she gave me some information that suggested that he was not always so balanced in his approach, not always so *perfect*. Like many of her coaches to come, Matt did not want to deal with Jane's injuries.

When it comes to injury, he just didn't want to hear about injury. . . . Well, all my

coaches have said it, my [institute] coaches, and even [Matt]. Even though [Matt] loves me to bits, he still didn't want hear about the injuries.

I thought about how Jane must have been in conflict in her relationship with Matt. On the one hand, she talks about the relationship being *perfect*; Jane portrays Matt as the *perfect* father figure, who loves her *to bits*. On the other hand, he does not want to hear about her injuries, and he communicates poorly with her when problems arise. I imagine that Jane might have developed an insecure attachment to Matt, one characterised by confusing messages and contingencies. In her relationship with Matt, Jane was rewarded with love and praise for being the *perfect* athlete, but shunned for being a little bit fallible, for being human. It does not seem surprising that Jane resorted to all kinds of overtraining behaviours in attempts to please her coach, and to keep receiving the love she craved so much. Jane ended up leaving the sport of gymnastics, having learned to rely heavily on her coach for guidance and support, yet also being given the messages that she should keep quiet and not complain about injuries, if she wanted to receive the coach's love and attention.

Jane was confronted with a whole new set of demands when she moved from gymnastics to track cycling. She had been bitterly disappointed with the loss of her intimate relationship with Matt. Perhaps, Jane was seeking to fill a new void left by the absence of Matt. Perhaps, she was seeking out a new father figure, a new object of attachment, whom she could please, and from whom she might receive love and attention. Unfortunately, Jane's next coach reinforced Jane's previous overtraining behaviours, and seemed to instil an even more intense commitment to training excessively and pushing through injury.

Yeah, basically I was training way too hard. My first [cycling] coach, [Jack], wasn't very experienced, and he was just thrashing me. He was a bit of a psycho. A lot of it was overuse kind of stress and injury stuff. . . . [Jack] was very theatrical and very, very abusive, actually, which I was pretty used to because my sister was a dancer, and ballet teachers are cruel, but, at the time, I saw that as quite a good

thing because, generally, if they're really on your back, and they're pumping you hard, it's because they think you'll make it. My coach's attitude was, "If you can't cop this, then you can't cop the pressure of the Olympics." So, although it would get to me at times, it actually worked well for me because it would make me angry, and that anger actually was quite a good energy. So, yeah, I felt strong by being able to cope with it. Whereas, other people were in tears, wanting to give up. I felt quite virtuous that I could cop the abuse. Besides, I was getting results, and I thought, "Oh well, maybe this is what it's all about." Also, I didn't know any better. I just thought, "Oh well, this is how it is with elite sport."

Jane was still so young. She was new to the sport of cycling, and she was accustomed to having a lot of attention from her previous coach. In gymnastics, Matt had supposedly looked after her, but he did not help her develop any sense of autonomy, or knowledge about self-care. In her new sport she had run head-on into a coach who will give her attention, but only if she learned to put up with his abuse, put her head down, and train hard.

Comparing Jane's first two coaches, it seemed like Matt had created an unhealthy dependency in Jane, whereas Jack hardened Jane, creating an unhealthy independence, underlined by fear and insecurity, where she coped by internalising overtraining behaviours, and an *I-am-tougher-than-everyone-else* mentality. It seemed to make sense to Jane because, as she commented, she achieved good results with Jack. Thus, Jane created, and tried to live up to, the identity of an athlete who could endure more than any other athletes. Nonetheless, Jane acknowledged that she did not enjoy her training very much at that time of her life.

I don't remember really enjoying it that much. I was permanently tired. The injury stuff was quite freaky, and there was always a lot of pressure If I strained a hammy, it was like, "Oh my God!" I ended up having to hide a lot of injuries and stuff because you know he just couldn't cope with it. So, stuff like rushing around to acupuncturists getting treatment, trying everything to get better, and I ended up [training] through a lot more injuries than I ever would now. So, it was kind of a blessing, actually, at World Juniors, when I crashed in my [race], and he was so mortified. He didn't even come up after me and see if I was alright. He just left the country, went off to France. . . . And I came back home after that, and I can't remember how long I had off, but the injury definitely got worse. It may be something important to consider, too, the psychological and emotional issues that come with being injured. . . . OK, I have got an injury, but, when I got back, the

pressure and being forced to train, and being forced to [race], what that does to you emotionally and psychologically, and how that might affect your body, and make the injury worse anyway; it was horrific. . . . Frustration, the anger, the depression, and everything like that that comes with injury, plus on top of that having a coach demand that you train. . . . Now, there's a trust issue that maybe he doesn't trust you at times. He didn't trust the physios. He thought that the physios were putting extra weeks on and trying for me to get out of training. . . . He had this impression that at times I was just a bit lazy and wanted to get out of training. Yeah, he was a nutbag! So, heaps of pressure, and he didn't know how to cope with failure or injury, at all. I was constantly pretending I wasn't hurt.

Jane talked about it being a blessing that her coach left her alone after she crashed in a European race, but I wondered if she might also have had feelings of being abandoned by Jack. It seemed that Jane was given the message that if she wanted the coach's attention, and if she wanted his trust and his love, she should keep quiet about her pains and injuries. She called Jack a *nutbag*, but I sensed that she was still quite attached to him.

Eventually, when Jane realised that she would have to leave Jack, she did admit to having a difficult time doing so. Despite the pressures, coercion, and abuse she had faced with Jack, Jane suffered when she had to separate herself from him, perhaps not unlike a victim finding it difficult to leave an abusive intimate relationship.

That was probably the biggest thing I had to do. I knew that, and I was miserable. I had to leave him, and that was awful, because he got me, basically, from nothing to being Number 1 in the world. I knew he was doing the wrong thing by me in terms of overtraining, and I was just exhausted, you know, [13, 14 years old], and a mess. So, leaving him was probably one of the biggest things I had to do in terms of changing. He went crazy when I left him. . . . At one point, he just got so angry, he just took a chair and threw it at me. . . . [Jack] was just a nutbag.

Jane acknowledged that Jack was pushing her too hard, and that he was abusive and aggressive in his behaviours, but she still believed in his method because she had been successful under his coaching. She had still been drawn to him, had still looked to him for love, and was crushed by the thought of leaving another father-figure, even such an abusive one. After training in this environment permeated with fear, tension, and pain, Jane internalised much of Jack's slave-driving mentality. This internalisation of abusive coaching practices then became all too complete; Jane moved into her next two training

environments as the abuser, the object of her abuse was herself, and the method of abuse was overtraining.

Jane's next move was to one of the institutes of sport in Australia, where she had been awarded a scholarship to train full-time. Jane was excited, thinking of the prospect of having a system of support and the country's top coaches to guide her.

So, it was a new start, and it was pretty motivational because you know you're there with the best in Australia, and you've got the best facilities, all paid for, and everything was great, but still. . . . Yeah, I went up for, I think, a couple of months, like a trial. . . . The coaches were so nice, and everything was perfect, and so I was like, "Yeah, yeah. I want to go back up." So, came home, packed my bags, and went back up.

Jane was constantly seeking the *perfect* relationship with her coaches. Her first two coaches disappointed her, left her feeling miserable and abandoned, and now she moved to a new environment, with hope to win the love and affection of her new coaches, the next targets of Jane's needs and desires. Jane's excitement about the training environment seemed short-lived, however, as she began to experience increasing pressure to perform to high expectations.

I stayed at the institute for quite a while, until realising that it was not the perfect environment. . . . I didn't know it at the time, but that's what they do. They are very cunning. . . . The coaches are so nice. They allow for injuries, and you don't have to train if you're tired. . . . "No problem. We'll cater for your needs." Yeah, that only lasts till they get you up there and then maybe for the first two weeks. . . . Once you're permanent [at the institute], they're nice, and then it starts to, you know, crunch down, but, um, I guess that's the [coaches'] way; you didn't really have a say.

Jane described feeling tricked by her coaches at the Institute. She had hoped for *perfection*; perhaps, she had hoped that someone would care for her the way she so desired. Someone might love her without her having to train excessively to win that love. Instead of feeling loved, however, Jane started to feel pressured, started to feel the demands to push herself.

I paused for a moment, wondering whether the coaches at the Institute were responsible for putting pressure on Jane to overtrain, to *crunch down*, or whether it was

Jane putting the pressure on herself. Perhaps, her perceptions of the coaches' expectations were biased by her past experience with Jack, and with Matt, and by her own internalised overtraining mentality. I asked Jane about the sources of these pressures. Her initial responses to my questions suggested that not only did Jane tend to push herself, regardless of what others said or did, but also the coaches maintained steady reinforcement for her overtraining behaviours.

I think I had a lot of that in me. When I was hurting, I did not talk about it, and I kept training through a lot, no matter what other people might say. . . . But the coaches were putting more and more pressure on me as well. . . . You know, if you did something wrong in training, they'd make you do more, or they didn't maybe realise you were tired, or sick, or injured; they didn't take that into consideration. . . . They were like, "More, more, more is better than recovery." So we never got to recover properly. . . . With injuries, where we were actively getting treatment and could still do something, we wouldn't rest; we would keep going. The injuries would never heal properly, and we would just have niggling injuries forever. . . . Yeah, still a lot of pressure to perform.

With respect to her coaches' reinforcement for overtraining, Jane also pointed out that her Institute coaches came from a country where cycling had a history of tough traditions, which coaches upheld and athletes did not question. Surrounded by these cultural traditions, Jane felt even more pressure to overtrain.

OK, in [their country, with these coaches], you didn't tell them what you can and can't do. They tell you what to do. It's the way they do things over there. They have a very militant style approach. They are very strong. They have always done things the hard way. . . . If I gave them the information that my calf was not right, my coach, he would say, "Get out there and do it!" I ended up having knots in my calf that were going into spasm, but still out there, and still that's the way they do things in their country. . . . To say, "No, I won't do that" is showing total disrespect; you just don't do it in their culture. . . . Besides, I didn't have developed skills in saying, "I'm a bit too tired to do that," or, "I need a bit more recovery from that," or, "That is way too much for me to do." . . . Coaches require you to do certain things. Coaches require, or they tend to be telling you when you should be training. . . . What happened [overseas] was one day we were about to go home, and I hadn't done a whole lot of training in that whole 4-week period because of the injury, but this one day we were at this [track], and the coach wanted me to [race against] a couple of girls that this [other] coach had brought specially in. . . . The risk of re-injury was huge, huge! . . . Two to three months after this was the trial for the Olympics, which I was hoping to compete in, and, in effect, I didn't. It was, literally, 12 months out from the Olympic Games, and, 12 months out from the Olympics, you don't want to flare up an injury that is going to put you off for at

least another 3 months. So it's a really critical time thing, and it was ego; it was a pride; it's the way they do things over there. In terms of the coach coming from that background, . . . oh, how would you describe it for him if I did not [race]? Humiliating? I had no choice. I had to [race].

Although Jane had strong tendencies to overtrain, even without a push from others, it seemed that she did not have much say in dealing effectively with her injuries. The way the coaches made Jane feel about injuries, and the way she felt pressured to train through them, was familiar territory for her. Jane had learned from a very young age to keep silent about injuries, especially if she wanted to receive love and attention from her coaches.

While training at the Institute, Jane never quite found what she was looking for in a coach. Even though she pushed herself hard, and tried to please her coaches, she never got close to them, emotionally. Jane attributed her dissatisfaction with training at the Institute to personality differences with her coaches.

A lot of it, I think, was my personality difference with the coaches. I didn't really get on that well with the [head coach], and he didn't quite understand me as a person, and I'd always put a lot of pressure on myself, and then get angry and upset, and he'd kind of say, "Oh, too hard basket!" about me. We didn't click. With the training, I think I was just getting assembly line kind of programs. It wasn't tailored for me. It was because at the [institute], with so many people he had under him, and he had [other big name athletes], basically I was just getting [their] programs, and I'm not [the same as them], so it didn't work. The cycle didn't work. I got pissed off, and we didn't get on and that kind of thing.

It sounded like the coaches were not satisfying Jane's needs for them to be loving parents. She did not get along well with them, and thus, she was left confused about how to win their love. At least with Matt, and especially with Jack, her mission had been clear: "If I train harder, push through injury, and don't complain about pain or fatigue, people will love me."

At age 15, Jane left the Institute and gave up her scholarship because of a difficult struggle with overtraining syndrome, or, what doctors had diagnosed as chronic fatigue. After almost a year away from cycling and any other type of training, Jane began cycling again in a new city with her new coach, Aaron. It was an opportunity for Jane to learn from

her past mistakes with overtraining. In support of this opportunity, Aaron promoted a balanced approach to training and recovery, encouraging Jane to work on her nutrition and her recovery, and to take care of her injuries.

He knew that I had a really bad year, a really rough year, and we sat down and discussed things we could do differently, like going to a dietician, and having someone tell me about eating carbs. He told me that I would have to eat, sleep, and recover properly, . . . and he would say that I should not be out there if I was injured. . . . So, with [Aaron], I went through the roof in terms of performance. Everything was going so well. Going to Aaron, I had big break-throughs in performance, really big breaks, and I just missed Sydney. Everything was going really well, and I was quite happy and settled.

From these first comments, it sounded like Jane might have found a situation that allowed her to change her overtraining habits. Aaron helped her to get to new levels of performance without overtraining her. It almost seemed too good to be true, and I was left wondering when Jane's internal slave driver would surface.

In her next breath, Jane admitted that she did not always follow Aaron's advice. She acknowledged that she had internalised the overtraining mentality of her previous coaches, and she identified with that mentality, saying it was part of her. Jane admitted to doing more than Aaron would ask of her.

I am a bit of an obsessive kind of control person. I am pretty highly disciplined, pretty driven, and, when someone was pouring overtraining into me, like with [Jack], I'd feed off it as well. . . . But with [Jack] I had an excuse because I was quite naïve in terms of what was right, but now I am still like that; it's in me. [Aaron] could tell me not to do something, and I'll still be driven to go out and do it, and [ride] extra kilometres at night, if I feel average. So, yeah, that is my nature for sure, a bit of an extreme person.

Overtraining had been so deeply ingrained in Jane's psyche as a way to win love and approval that she kept resorting to that behaviour with Aaron, often against his suggestions to take more recovery. Furthermore, Jane reframed Aaron's comments about injuries in ways that kept her in overtraining mode.

My coach . . . was very good about injuries. He would tell me to take a break, if I needed it. He used to say if your injury is distracting you and you could use it as an excuse for not doing well, then you shouldn't be [out there]. Now, unfortunately,

the way I took that was to disassociate. Don't let it distract you, no matter what it is. So, if I was hurting, I would be saying, "I'm fine," and would go and train when I'm dead tired, or I haven't eaten, or exhausted, or feeling sick. If I'd ever said how I was really feeling, he'd say, "Well, go home and rest." I'd say, "No, I don't want to go home, and I want to [ride]. That is why I am here." . . . So, I probably was a little dysfunctional in my way of dealing with that.

By this point in the interview, I could not help feeling frustrated that Jane had kept pushing herself under Aaron's leadership. I suppose that frustration came from my identification with Jane's strong internal drive to overtrain, coupled with envy that she had a coach like Aaron and I had never found such a coach in my years as a competitive athlete. Why did Jane keep overdoing it? She was achieving success with Aaron. She did not need to push herself harder. Was the influence of her former coaches so strong that she could not change her maladaptive behaviours? I began to wonder if Jane's perceptions of how she might win love and approval from Aaron had something to do with her continued overtraining behaviours.

In the past, Jane had been accustomed to keeping silent about injuries and fatigue, and she had been rewarded for such silence. Perhaps, she was looking to be rewarded with love and praise from Aaron in the only ways that she had been taught.

I'm really good at hiding how much I am struggling, so [Aaron] probably hadn't had the opportunity to say, "That's a bad example." They only see you as a good example because, when you come to training, you are there mentally and physically. You know, if training is an hour and a half, you are there 20 minutes before you start. So, they use you as an example. That kind of pushed me even more because you want to be an example.

I sensed that wanting *to be an example* was equivalent to wanting *to be loved*. Jane was convinced that she had to keep up her *tough* image, if she was to win love from Aaron. Yet, it sounded like Jane did not give Aaron much of a chance to understand what was going on with her body. She did not want to tell him when she was tired or hurting, which did not allow him to suggest more adaptive responses to training and recovery. Perhaps,

Jane felt that Aaron did not give her enough attention. Perhaps, he did not give her enough love.

Despite having some great success when she first started training with Aaron, Jane started to slip back into a state of fatigue. When I asked Jane about how her coach responded to this period of overtraining syndrome, she suggested that he could have been more available to support her.

S: How was your coach around all these things? Did he really know what was going on?

J: Yeah, but he didn't have the time, really, to do anything about it. He was concerned and, obviously, he was telling me all the way along, "[Jane], if you don't stop this, if you don't change this, and sleep, and eat properly, you're not going to perform!" I was kind of like, "Oh, whatever. I can still do it," Then, when I got [overseas], I was just dead. I was just a corpse out there, and I thought, "God, it's true!" . . . But a lot of me still had a lot of resentment in terms of, "You aren't there for me the way you used to be at the beginning. We don't talk, or have the time that we used to." I had all this pissed off energy . . . and he'd say "Hi," and I'd say "Hi," and then just go and do my stuff, when inside I am thinking, "Actually, I am quite pissed off that I've come to [this city] because of you, and because of [cycling], and I'm lonely."

Wow! All of a sudden, the anger was coming out toward Aaron. Jane was pissed off because he could not help her from feeling lonely. Aaron was not fulfilling Jane's fantasised ideal of a coach, the ideal of a caring and loving father figure, the one who *should* make everything better, and she was pissed off by her desires being frustrated.

At this point, I could not help thinking about what Jane's relationship must have been like with her parents. I wondered how her relationships with her parents might have affected the dynamics she developed with these different coaches across her career.

Jane's descriptions of her parents, especially her Mum, left little doubt in my mind about what I had begun to suspect during the interview. It had seemed to me that Jane's desperate attempts to please her coaches had been a transference of a dynamic she had learned at home, perhaps one in which she felt her parents' love was contingent upon her success in sport. Jane started off by telling me that she felt her parents were over-involved

in her sports.

S: How were your relationships with your parents through your sporting career?

J: Well, I thought it was always pretty good, but I always thought they were too involved, like Mum being on the administration of the [cycling association] and Dad the president of [the club]. I didn't want them to be involved, but that's what happened. . . just too much. I like to have my family, my social life, and my sport, different. I don't like to combine them. It just annoyed me, the fact that my family would be involved that way. I just wanted them to be supportive of me, just me, not everyone else.

Jane had mentioned earlier in the interview that she used her sport to distract her from the rest of her life, to fill the void left by her loneliness. Talking about her parents, Jane seemed to have been crying out for love, crying out for her parents to save her from her loneliness, and to focus attention on her, not on her sport, and *everyone else* in her sport. These cries, *be supportive of me, just me*, sounded more like *love me for me, just me, not for what I do*.

In her next comments Jane told me about the importance her Mum placed on her cycling, and how her Mum made her feel unworthy of attention when she was not training or competing.

I thought they were really good until I realised Mum was sort of more pushy. When I quit [cycling], she wouldn't talk to me, and then, as soon as I went back, she was my best friend, and took me shopping. That sort of hurt me. It's the silence that makes you feel like that. It was sort of just like, "Right. So this is, obviously, what she wants me to do." I did not necessarily feel accepted, but that is how she'd be happy with me. Now that I haven't [raced] for two years, it's been really hard. We are still not getting along. She's a nightmare, absolute nightmare.

It was heart-wrenching listening to Jane. I could see the pain in her eyes. She appeared to love her Mum, but she did not understand how she could make her Mum happy. She could not find a way to feel *accepted*, or to feel loved. Jane's response to her Mum's unreliable and contingent love had been to turn to her coaches for love and affection. She would do anything, including training excessively and pushing through horrendous injuries, to keep

them happy. Jane's Mum had also modelled overtraining behaviour in her own athletic career, having pushed through debilitating injuries on several occasions.

I think I come from a family that copes very well. It is very solution orientated. I have a mother who broke her neck [cycling], and had three fusions, and her coccyx removed, and, yeah, she never says die. I think that's been a role model.

What Jane learned from her Mum was that the response to injuries was to *never say die*, or in other words, try to ignore them if you can. Furthermore, at times, her Mum even questioned whether the injuries were real, or whether they were created in Jane's mind.

Jane described how her Mum seemed to believe that Jane used injury as an excuse to discontinue her sport.

I think, at the start of my back problems, they didn't realise the severity of it, and they just said, "Oh, is it psychological or is it really an injury?" Because there wasn't a real answer to what the problem was, originally. I sort of felt that she thought that I was just making excuses not to [cycle] anymore. I know she really wanted me to go [overseas], and continue my scholarship, and everything like that, and I really wanted to go as well, but it just came to the fact that I couldn't [race or train], and I needed to [compete] to be there. Yeah, so, Dad was always good about injuries and stuff, but Mum more on the pushy side. Friends and people had always said, "Oh, does your Mum push? Does she push you?" I thought, "No, no, no, she's being supportive," but, when I stepped away from it, I could see it. She still, now, wants me to be a little world champion.

Even though Jane says that she wanted to continue cycling, and to go overseas to train and compete, it sounded like her underlying motivation was not about pursuing cycling, but about pleasing her Mum. Furthermore, even if she could please her Mum by being a world champion, she would still be a *little* world champion, as if she was saying, "I can never be grand enough for my Mum, no matter how hard I try to please her." Sadly for Jane, instead of feeling she had pleased her Mum, she felt accused of faking an injury.

I wondered how a Mum could be so hard on her daughter. Perhaps, it was because Mum was thinking about herself, and not about her daughter. Jane had told me that her Mum had a big disappointment as an athlete; Jane's Mum had ended her own athletic career early because of a serious injury, shattering her dreams of being a world champion

in cycling. From Jane's descriptions of her Mum's pushy behaviour, it sounded like Mum was driving Jane to heal the wounds of her own past.

Trying to fix Mum was a powerful motivator for Jane, one with which I could empathise. In my case, I had grown up with my father's legacy of Olympic disappointment in rowing. He had gotten sick, coming close to death at an Olympics where his team could have won gold. Although my Dad never pushed me directly, and was supportive and loving, I felt that I could take away the pain from his past if only I could do what he had not done, which was to get the Olympic gold. The desire to make my Dad proud, to heal his wounds, and maybe to be better than he was, had been enough for me to push myself to the point of overtraining. I could only imagine the pressure that Jane experienced from the combination of Jane wanting to fix her Mum and Mum overtly pushing her to do it. This pressure left Jane full of confusion about her own motivation to participate in her sports.

I think Mum's motivation comes from the fact that she knows I could be the best in the world, like she had hoped to be, and she just wants me to fulfil that, because she knows that's what I want to do, but I don't believe in myself, because of my injuries and stuff. So, I think she just wants the best for me, even though I don't think she does sometimes, but she's a parent.

Jane was full of contradictions here. She sounded like she was trying to make excuses for her Mum, but under it all she sounded angry with her Mum. She seemed to suggest that it was okay for Mum to push her against her will. It was okay for Mum to make her love contingent upon Jane's success in sport, as long as the motivation was to prove to the world that Jane was the best. It was all okay because Mum wanted the best for Jane, but really Mum only wanted the best for herself, and it was not okay for Jane. Looking at Jane during this part of the interview, I could see nothing but pain and confusion.

Jane's Mum had also become so involved in Jane's sport that she went out and taught herself about the physiology and the mechanics of cycling. Despite not being a

coach, or part of any support staff, she tried to explain to Jane how and why Jane's body would respond in different ways, seemingly trying to justify pushing the training harder.

Mum would try to explain what was going on in my body, that it was an adaptation to get over, but you don't listen to them. You can't understand, being so young. You can't understand what's happening. So I was like, "Yeah, whatever Mum." Because I just wanted her to be a Mum. I didn't want her to be an expert. I just wanted her to be a Mum, to be there if I crashed, but she wasn't.

Jane had just wanted a Mum. It sounded simple. She wanted love, but Mum only gave her contingent love, if she competed and was successful in sport. It seemed natural for Jane to seek out love and approval from her coaches, potential substitutes for her Mum when she was at training.

Up until this point, Jane had focussed on how her Mum had pushed her to compete, and I was left wondering how her Dad fitted into the picture. She had mentioned earlier that she felt he was over-involved, being the president of the cycling association, but she had said that he was *always good* about not pushing her. When I asked Jane again to reflect on the origins of her drive to push herself, she began talking about her Dad.

S: Where do you think your desire to push yourself came from?

J: That's just me.

S: That's just you?

J: Yep. I think my Dad is fairly driven. My Dad's the same. He pushes himself, and he is a hard worker, and totally motivated. Dad is like me, but not to the same degree. He's probably another step down. I'm pushing my limits, but he's so much like me, and that's where it comes from. . . . I think I'm a little bit the son my father never had.

Jane identified with her Dad. Maybe she thought that by emulating Dad, or being tougher than he had been, she would impress him enough to love her more. Perhaps Jane thought, if she could be more like a boy, a tough boy, ready to push herself like Dad, then he would love her more. Jane did not tell me any more about her Dad, but I had heard enough from her brief comments to see that some of her overtraining behaviours were also

manifestations of a desire to please her Dad.

After listening for the last hour and a half to Jane talk about how she had learned to overtrain to please her coaches and her Mum, and to emulate her father; after listening to how Jane had experienced terrible injuries, and battled with chronic fatigue, I was curious about how Jane might have changed her views on overtraining during the course of the interview. When I asked Jane to reflect on her history of damaging behaviours, Jane admitted that she still struggled with her internal drive to do more: “I’ve got a lot of that in me now, where I’ll train through stuff that I know most people would miss out on, even though I know better. So that’s still in me.”

Jane had overtrained and had admitted that it had been extremely damaging, physically and emotionally. Nonetheless, she still appeared to feel exalted in her tough image. It seemed that she still wanted to put herself above others for enduring more than they could. For example, she criticised fellow athletes for taking time off, complaining about being hurt, and not pushing through injuries.

I just see everyone else in my squad now just taking a day off because they’ve got a sore calf, and I am like, “Are you kidding? I’m [competing] with stress fractures!” . . . I’ve known one guy, and he’s really well-balanced as far as his body goes. . . . I remember he had a fall, and I had to take him to hospital. It was embarrassing because he was squeaking so loudly, but he just says he has no problem about it. Now he’s an incredibly selfish, self-centred, egocentric person. The universe revolves around him, and, I think, in a lot of ways, it works really well because he doesn’t care who thinks he might be a wimp. If he’s in pain, he’s in pain. He lies down; he dies right there, no matter what other responsibilities he may have towards other people.

Jane equated taking time off for recovery, or complaining about injury, with being irresponsible and selfish. She distanced herself from an athlete who was more balanced in his approach to recovery, maybe because what he represented threatened her identity. It sounded like Jane still had some way to go in changing her thoughts about overtraining, and in freeing herself from her past.

When I asked Jane about her perspectives on having a more balanced training program with Aaron, she admitted that she did not think she was training hard enough.

Actually, it seemed, at first, that the new training program probably wasn't hard enough. It was like I went from one extreme to another, and it was hard in terms of elite level. It was also quality technical advice that I'd never had before, but I'm so used to this kind of aerobic fitness and strong, general kind of training. I was used to doing more.

Jane illustrated the power of her overtraining mentality. She had a new coach who had taken her to new heights of performance, yet she questioned the training program because she did not feel like she was working hard enough. Jane also talked about having a hard time taking a break after a recent injury, even though she had gone through a crippling struggle with chronic fatigue previously in her career, during which she had not been able to train at all.

Just recently, I got forced to have 4 weeks off, when I came back from the Good Will Games, and it was the longest 4 weeks. Instead of just embracing it and saying, "This is great. I need this. I haven't had this much time off in three years," I was fighting my coach, saying "Can't I just do something?" Now I'm back training, and I guess I shouldn't have whinged. I find it really hard to sit back on a Sunday and go "It feels good not to go to the track today." I find it really hard.

Even after Jane's claims that she recognised her behaviours as maladaptive, she continued to overtrain. I asked her if there was an explanation for these contradictions between her thoughts and her behaviours. Jane struggled to find an adequate explanation. Looking back at her response to the onset of her chronic fatigue, Jane remarked that all she could think was that she had not been fit enough, and probably had not been training hard enough.

I was used to being tired, but I wasn't going fast, so I mustn't have been training hard enough. So, I went out and did more training, and when I didn't complete a session, I'd come down in the afternoon, and try to complete a session and a half. It got to the point where, for a few weeks, I'd would go out and [warm up for only a short time], and I would have to just stop, and turn around, and go home. Then I'd be so irritated with myself, and my performance, and that's when I had to make up for two sessions. It was just so ridiculous. I see it now, and I'm frustrated because I didn't recognise it then. I think I really felt like I should have been coping, and I was just angry about not coping as well as I wanted to, but I was very reluctant to take time off. I was used to completing my training program all the time, and I always completed my training program. Gosh, retrospectively how stupid was that?

It was so silly because I wasn't being lazy, but at the time, oh, I don't know, I just thought I was lazy. I thought it wasn't the program. I must have been lazy.

The harsh internalised critic that Jane had developed from the influences of her Mum, her coaches, and her father, would not let her rest, even when she could see that it was *ridiculous* to keep going. That internal critic kept telling Jane that, when she felt tired, it must have been because she was being lazy.

If pressure from coaches and having parental love contingent on success were not enough to push Jane to constant overtraining, she told me that she had also felt the pressure from a tough sport culture. She said that athletes in her sport would be severely judged, if they did not train through injury, or keep silent about pains, niggles, or illnesses.

It's the culture of our sport as well. I think there are a number of things. It's very much, "Do or die. Don't be a wimp. You fall, you get back up." . . . I didn't actively think, "I am not going to let it affect me." Instead, I was so in the culture that I just didn't let it into my head at all. . . . That probably was quite a strong factor in why I didn't want to stop, because for me, maybe I would have seen that as weak, myself. . . . You know, you break your arm; I've [competed] with a broken arm before.

You suck it up. You keep going, and anybody that stops for a physical reason, there's an implication that, unless you're almost dead, you keep going. . . . So, yeah, it's very much part of the culture. You'd better be dead before you don't go. . . . It's a real tough sort of sport and . . . to be sitting out at training was just not on. There was this mentality that you were weak, or you were a bludger.

Jane had heard the message that she had to keep training unless she was, figuratively, *dead*. I paused for a moment, thinking about this contingency, this cultural imperative. If you are not *dead*, then you have to keep training. The corollary to this idea was that if you were *dead*, then you would not have to train, or at least you would not be expected to perform to expectations. Perhaps, if Jane *killed* herself with overtraining, she would have an excuse for not performing well. I started thinking that maybe part of Jane's overtraining had also been about self-handicapping. If she overtrained to the point of incapacitation, then she would have an excuse for not performing well. When athletes have overtrained, no one can accuse them of not working hard enough, and no one can judge them based on

their performances because they had not been at peak fitness. It seemed that Jane had been trapped using overtraining both as a mechanism to win love and approval and as an excuse for failing to perform. I identified with Jane as much as I resisted acknowledging it.

Perhaps, I too had used overtraining as an excuse for never making it to the Olympics in rowing. Jane acknowledged that overtraining could be a trap, a vicious cycle.

It was a whole cycle, and I was training so hard for the wrong reasons. It was also because I love it, and it's, essentially, why I'm here. I didn't want to feel that I had any reason not to train. So I fell into that trap, obviously, of just forgetting, or ignoring, that I was tired, or sick, or run down, and tried to forget about it, and just kept training.

As the interview came to an end, Jane left me with a final glimpse at her damaged emotional state. It echoed for me John's last words about wanting sport to *fix* him, because Jane also was desperate to be *fixed*. In Jane's case, however, she did not look back at her career with regret, like John had; rather, she looked back with anger that no one could *fix* her.

There's certainly a lot of things that I have gauged from my experiences, which isn't to say I'm not really very angry about all of it, still, and pissed off about the whole situation. I mean, I just don't understand how these coaches get to where they are without a brain. . . . Why aren't they there to help athletes? . . . It frustrates me a little bit that they see young athletes doing the wrong thing, and they don't say, "You shouldn't keep going." But there's no benefit in me being wound up, or bitter, or twisted, or anything like that.

Listening to Jane talk about being pissed off, I got the sense that she was angry at everything to do with sport, and the people in it. Like John, Jane was faced with the reality that nobody could *fix* her. Nobody could make her feel whole, or could satisfy the desires she had to feel loved, or could fill the gap left by her parents. It seemed to me that there *was* benefit for Jane in telling me that she was left *bitter* and *twisted* from her experiences in competitive sports. Perhaps, she was looking for validation of this tempest of negative emotions, which had been gathering in her over the years. In some ways, I wanted to give Jane this validation, to allow her to express openly her anger at competitive sport, but in

other ways, I recoiled from the thought of criticising competitive sport more than I already had. Jane also seemed to approach and then recoil from her negative emotions, expressing them and then telling me that there was no benefit in allowing them to continue within her. Perhaps, Jane and I were colluding in protecting our now tainted faith in the *goodness* of competitive sport. With Steve and John, there was regret about their experiences in sport; if they could just go back and do it again, then things would be better. With Jane, there was no longing to go back and change things; there was just anger. Jane started her athletic life off balance with a heavy push from her mother, a mother anxious to re-live sport glory, vicariously, through her daughter. With her Mum's push, and her father's modelling of overtraining, Jane did not have space to develop a balanced identity. She became a *perfect* candidate to develop overtraining, and most of her coaches seemed more than eager to support this development. When Jane finally did fall under the guidance of a balanced coach, she struggled against herself, having found it extremely difficult to change her pathogenic training behaviours.

After finishing the interview with Jane, I felt unsure whether she would ever change, and maybe I also wondered if I would ever change. I wondered if Jane would ever come to accept that she was okay, without having to damage her body with overtraining. I left hoping that one day Jane would feel worthy of love, regardless of success in sport. I hoped that she would not have to use sport to distract herself from loneliness. I hoped that she might feel at peace with letting go of her sport when it came time to end her career. I hoped that one day competitive sport and the people in it, including coaches and parents, would cease to drive young athletes, like Jane, to overtraining. I hoped that both she and I could have our faith in the *goodness* of competitive sport restored. These hopes were big things for me and for Jane, but change has to start somewhere, and hope seems as good a place as any.

Study 2 Discussion

Athlete Perspectives and Risk Factors for Overtraining

Reflecting on the aggregate stories of Steve, John, and Jane, and the thirteen athletes on which these three stories are based, I have been fascinated, surprised, enlightened, saddened, and angered. Sometimes, telling the tales of these athletes flowed from my fingertips. At other times, I struggled, word by word, to present their stories and my interpretations of them. I have realised that the most difficult parts were those that had triggered my own pathology and resistances around overtraining. Parts of their stories I reluctantly identified with, but I wanted to block those bits out, often engaging suppressive defences similar to those of the athletes who were telling me their stories. At times, I got lost in the interviews, forgetting that the goal of my thesis was to draw out risk factors for overtraining. At these moments, I might have feared that I was not asking the *right* questions, those that would prompt athletes to tell me about OT risk factors. I realised, however, that following the athletes in the interviews was more important, and would reveal more than pressing forward with any agenda about risk factors. Regardless, after constructing the three tales, I saw that more was exposed about risk factors, and pathogenic athlete behaviours, than I had anticipated. Supporting the experts' perspectives on OT from Study 1, the participants displayed personal characteristics of OT-susceptible athletes, experienced influences that motivated them to train harder or push through injury, and had gone through times where situational factors increased their stress loads, and negatively affected their capabilities for adequate recovery. The athletes' stories went further, however, than the expert perspectives, revealing some of the less talked about issues surrounding overtraining, in particular, psychodynamic and other familial influences on athlete behaviours. In the next two sections, I present what I felt were the two most significant themes to emerge from the athlete interviews: the influences of coaches and

parents, and the issue of injury within the context of overtraining. Following these sections, I then present a comparison between athlete perspectives on, and experiences with, overtraining from the interviews and from materials presented in the literature review.

Coaches and Parents

The most salient OT risk factors emerging from the athletes' stories were the influences of coaches and parents. In examining both personal and situational risk factors for OT, it seemed that coaches' and parents' behaviours could be represented as both external and internal drivers. As external drivers, coaches and parents overtly pushed athletes to overtrain, telling them that the only way to succeed was to train harder. As internal drivers, images of coaches and parents often became entrenched in the athletes' psyches, and in some cases, entwined with their identities. Through parental and coach patterns of reinforcement, and contingency-based dispersal of love and approval, coaches and parents prompted athletes to internalise overtraining approaches to sport. Listening to the stories of the athletes, it appeared that they often started to develop overtraining behaviours at young ages in their sports, the ages at which they relied heavily on their coaches and parents for guidance and support. These early experiences seemed to be crucial in forming the athletes' responses to overtraining demands later in their careers. The athletes represented in Jane's tale illustrated the potential for these internalised experiences to drive athletes to overtraining, even under the leadership of balanced coaches. With coaches who do not have balanced approaches, the risk for overtraining is always present. Even when athletes get older and might feel more comfortable speaking up for their needs, they are still susceptible to being pushed to overtraining by their coaches, because most sports are hierarchically structured with the power distributed primarily to the coach. The influence of a coach operating in such a hierarchical structure was

illustrated in the athletes who made up Steve's tale of professional football, and I imagine might be replicated in many other professional and amateur sports. The athletes who became John illustrated the roles that coaches play in colluding with the athletes in their pursuits of Olympic glory, in their desires to be worshipped as heroes, and in their beliefs that overtraining is the way to get to the top.

This emphasis on coaches' and parents' responsibility for creating, reinforcing, and maintaining overtraining behaviours is critical to me. I can think of several examples of athletes I have known who have been blamed for their injuries and other overtraining outcomes. Coaches or teammates have said that the injured athletes brought misfortune upon themselves because they were perfectionists or because they did not take responsibility for their own bodies; in a way, it sounded like they were *blaming the victims*, and perhaps prompting the athletes to stay trapped in their cycles of misfortune. Human behaviour does not occur in a vacuum, however, and past experiences tied to current realities and demands are significant contributors to the creation and maintenance of personal behaviour patterns, dispositions, and traits. I sensed that these overtraining behaviours I witnessed in fellow athletes were largely products of their experiences in sport and of their experiences in their dynamic interactions within their families.

The overtraining behaviours described in the tales of Steve, John, and Jane illustrated how overtraining habits are initially adopted to please coaches and parents. Child athletes most likely could not design complex training programs or understand the requirements for maximising training and recovery in competitive sport, so they turn to their coaches and parents for guidance. If those coaches and parents promote overtraining behaviours, make expressions of love and approval contingent upon the young athletes' hard training efforts and sport successes, and do not teach the athletes to take care of their

bodies, then young athletes do not seem to be left with any alternatives but to adopt the overtraining approach.

Injury in Overtraining

One of the other salient issues to emerge from the athlete interviews was how injury seemed to be the most common outcome of overtraining behaviour. As mentioned at the outset of this thesis, originally I thought I would be looking at overtraining processes and only one outcome, overtraining syndrome, when exploring OT risk factors. I found, however, that injury appeared to be one of the most common outcomes for athletes engaging in overtraining behaviours. Furthermore, the experiences of injuries, and maladaptive responses to them, were often the sources of future overtraining behaviours in the athletes interviewed. For example, many athletes who were used for all three stories experienced significant injuries, about which they felt guilty, from which they were left feeling behind, and to which they reacted with increased training efforts, premature returns to training and competition, or further denials of the consequences of new injuries, all resulting in worsening of the injuries. The experiences of injuries, and the overtraining responses to them, created vicious cycles from which athletes had difficulty escaping.

The issue of injury in the context of overtraining is not a novel concept; researchers (e.g., Kibler & Chandler, 1998) have talked about injury as a significant outcome of overtraining. Nonetheless, it seems that much of the OT research (e.g., Hooper et al., 1995; Morgan, et al., 1987; Rowbottom et al., 1997; Uusitalo et al., 1998) has been concentrated on one outcome, overtraining syndrome, and not on the process of overtraining, which can lead to several adverse outcomes, including injury, illness, OT syndrome, and numerous other physiological and psychological disturbances. My sense is that when talking about overtraining, and doing research on OT syndrome, it might be important to specify that OT syndrome is only one possible outcome. The narrowness of focus, and lack of

acknowledgement of injury as a significant outcome of overtraining processes, or of stress/recovery imbalances, adds to the risk of misattributing causes of injury to bad luck, or to acute uncontrollable factors, when the causes might be rooted in controllable, chronic behaviours. The inclusion of injury in discussions of overtraining also has relevance to sports where overtraining syndrome is unlikely, but where, nonetheless, overtraining processes can occur. For example, in sports that emphasise technical training over fitness training, such as diving, athletes might not stress their bodies aerobically to the point where they experience the lack of energy and chronic fatigue symptoms of OT syndrome, but they may overstress a particular muscle or joint from repetitive technique work and inadequate recovery of that muscle or joint. Furthermore, in all sports, there is potential for an overtraining response to an already existing injury (i.e., trying to return to training too soon, thus increasing risk for re-injury).

Before leaving this section on injury, I think it is important to mention that the experience of illness in the context of overtraining shares similarities to injury, and is also a significant outcome of overtraining processes. Although illness was not highlighted as much as injury within the athlete stories, many of the thirteen athletes talked about having struggled with viruses, colds, and other debilitating illnesses during times of peak training. In support of this link between overtraining and illness, Mackinnon (1998) pointed out that frequent illnesses are considered common outcomes or symptoms of overtraining, with similarities among symptoms of overtraining syndrome and infectious illness. Steinacker and Lehmann (2002) also suggested that high training loads are associated with increased risk of infections, and, Nieman (1998) noted that endurance athletes are at higher risk for upper respiratory tract infections (URTI) during periods of heavy training. Similar to the niggles experienced during the early onset of injury, minor colds and infections might be indicators of stress recovery imbalances, which if left unaddressed, could lead to more

serious overtraining outcomes. It is conceivable that athletes might try to train through illnesses instead of taking the recovery necessary to get better, or they might try to return to training too early after having had time off due to illness.

Athlete Interviews Compared to Athlete Experiences from the Literature

To get a sense of how the athlete stories in this thesis reflect other athlete experiences presented in the literature, I have examined the parallels among quotes from the athletes I interviewed and those quoted by a number of researchers in the field. Comparing these various athlete experiences to one another, there appeared to be many parallels in OT themes, and in the following sections I outline these parallel themes: the roles of coaches, injury issues in overtraining, sport culture, and personal factors.

Coaches

In the literature, several authors (e.g., Kellmann, 2002; Krane et al., 1997; Wrisberg & Johnson, 2002) presented quotes from athletes, illustrating the strong influence coaches have in driving OT behaviours. In the examples presented in the literature review, and in the three aggregate athlete tales in this thesis, it was evident that coaches pushed athletes to overtraining through excessively demanding, often abusive, training practices, through patterns of reinforcement, and through sometimes subtle attitudinal influences. In particular, the thirteen athletes' experiences represented in Steve, John, and Jane's tales reflected similar experiences to ones presented by Kellmann (2002) and Krane et al. (1997), in which coaches pushed athletes too hard, and the athletes followed the coaches' demands, despite feeling that they were being overtrained.

The story Krane et al. (1997) presented of a young gymnast driven by abusive coaches echoed the experiences of melded athletes in Jane's story, especially those experiences with the coach known as *Jack*. In these cases, the athletes appeared to have been aware that their coaches were pushing excessively, but they continued to obey their

coaches, believing that the coaches' methods were what brought them success. The athletes appeared to be so attached to any possibility of receiving love and approval from their coaches, they would do anything to keep the coaches happy. Similar to the contradictory emotions directed toward an abusive coach illustrated in Jane's story, in which the athlete shifted back and forth between love and hate, the Krane et al. gymnast also expressed a bundle of mixed emotions. The gymnast had said that her coach was *excruciating, yet wonderful* at the same time, for pushing her to train with pain, and to endure physical punishment for making mistakes. In my construction of Jane and in Krane et al.'s story, the athletes appeared to have been trapped in dynamics with their coaches that replicated coercive, conditional dynamics that they transferred from their relationships with their parents.

With respect to coaches' abusive behaviours, there were also parallels among experiences detailed in Steve's and John's stories and experiences of athletes quoted in Wrisberg and Johnson (2002). In particular, Wrisberg and Johnson presented quotes from an athlete who talked about feeling humiliated, denigrated, and verbally abused by her coaches. Athletes incorporated in both Steve and John's stories talked about the humiliation they suffered when coaches had used them as illustrations for teammates of *bad* behaviour, or had called them derogatory names. In all of these cases, the abusive behaviours of the coaches prompted the athletes to turn to overtraining as a coping mechanism. It seems that the role of the coach in influencing overtraining behaviours and associated adverse outcomes cannot be emphasised enough. Furthermore, looking at the experiences highlighted in Jane's story, where the athletes internalised coaches' maladaptive attitudes and behaviours, it seems that one could take into consideration most of an athletes' experiences with past coaches when assessing risk for overtraining.

Injury

Another significant theme to emerge from both the literature review and the athlete interview chapter was the threat that injury mismanagement posed to the long-term well-being of the athletes. Coaches' attitudes and behaviours appeared to be the most influential factors causing poor injury management. Both Wrisberg and Johnson (2002) and Krane et al. (1997) quoted athletes who had been pushed by their coaches to train and compete though seriously injured. In the Krane et al. example, the young gymnast talked about training and competing with multiple, serious injuries. In the experiences outlined in Steve, John, and Jane's stories, athletes described scenarios where coaches pressured their athletes to train or compete with stress fractures, pulled muscles, and broken bones. Coaches used abusive and sometimes coercive tactics to influence athletes to push through injuries, sometimes getting angry at the athletes for being injured, and other times acting childishly to make the athletes feel guilty for being injured. In all cases, coaches seemed to promote the delusion that injuries would go away if athletes blocked them out.

Sport Culture

Athletes described in both this thesis and the literature talked about the pressures they experienced from the subcultures of, and social expectations surrounding, their sports. Gould et al. (1993a) provided an example of a figure skater driven to think obsessively about her weight by the constant emphasis placed on appearance by everyone in her sport. This obsession with weight, and the corresponding overtraining behaviours aimed at losing weight, were reflected in Jane's story of struggles with disordered eating in attempts to fulfil the demands of coaches and the perceived aesthetic demands of the sport. In Steve's story, there also was an example of struggling to maintain an image imposed by the sport subculture, which, in this constructed story, was the image of the tough footballer.

In terms of living up to expectations of the general public or of people in sports institutions, Gould et al. (1993a) and Wrisberg and Johnson (2002) provided examples where athletes expressed feelings of *shame*, of being *condemned*, or of being stressed out for not living up to the standards set by people around them, including people from athletic organisations. In the three stories of Steve, John, and Jane, several athletes, who constituted the tales, talked about feeling shamed or humiliated for not living up to cultural imperatives. Athletes in Jane's tale talked about keeping silent about injury and maintaining façades of health because of the pressures they perceived from people at the elite sports institutes. In Steve's story, the pro footballer interviewed talked about the heavy burden of expectations from the coach, the team, the media, and the public. One of the Olympians in John's story related how he felt *crucified* in front of the world for his failure to make his country proud. In all of these cases, the pressure of expectations from others added to the stress loads for which these athletes needed extra recovery. For some of these athletes, these added pressures also led to pushing excessively in training in order to compensate for their perceived shortcomings.

This issue of cultural imperatives to push bodies to the point of severe damage and incapacitation has been largely left out of discussions on OT, but these problems have been examined in sport sociology research linking dominant codes of masculinity to sport injury risk (Young & White, 2000). In reviewing the literature on incidence of sports injury, Young and White suggested that the disproportionately high rates of injury among young male athletes support the notion that cultures of hegemonic masculinity promote (even demand) risk-taking behaviours, including participating in sport while experiencing significant pain and debilitating injuries. The footballer in Steve's story epitomised an athlete trying to live up to codes of dominant masculinity in sport, about which Young and White commented:

To be socialized into most dominant forms of masculinity [not only] involves learning and celebrating emotional denial, distance, and affective neutrality, but also the cultural importance of actions that often exact a physical toll. Male prowess often is based on types of physicality that are frequently destructive . . . [and] often involve conspicuous silences around health. As a result, sensitization to bodily well-being and matters of preventive health in general become viewed as the jurisdiction of women and “ambiguous” men. (p. 113)

In Steve’s story, the constructed footballer talked about times where he was forced to play with pain, and pushed into participation by humiliation and coercive tactics. Living up to cultural ideals of dominant masculinity in sport, however, is not just an issue for males, and both male and female athletes represented in the stories of John and Jane appeared to feel the pressure to *tough it out* when injured, sick, or excessively fatigued. All of these athletes seemed to buy into, or at least give into, the *no pain, no gain* and *more is better* slogans constantly trumpeted in their sports. Furthermore, athletes represented in all three tales also alluded to the *conspicuous silence* around injuries reinforced by their coaches and parents. Although they did not talk specifically about OT, Young and White hinted at the role of dominant masculine cultures in contributing to OT-related injuries:

Overuse injuries are also examples of negative health outcomes that may be associated with dominant forms of masculinity, but not necessarily with sports that involve direct violence to the body. Some male athletes construct alternative ways of masculine identification by focussing more on endurance than aggression. (p. 116)

Aside from the footballer in Steve’s story, the other male and female athletes represented in the three stories were not involved in violent, contact sports, but nonetheless turned to overtraining behaviours, such as increasing training efforts, to assert their identities as tough athletes. Although Young and White stated “There is currently a significant silence in the culture of *male* sport about the physical toll exacted on players in the process of sport-related masculinization” (p. 123), it seems, from the athlete interviews, that both male and female athletes are pushed keep silent about pain and injury and to conform to the masculinisation processes inherent in the arenas of competitive sport. Recognising (and

combating) the powerful influence of sport cultural processes in contributing to the causes of injury, mismanagement of injury, and overtraining behaviours, appears to be a meaningful part of coping with and making adaptive decisions about training and recovery, and engaging in effective responses to injury, illness, fatigue, or other setbacks.

Personal Factors

Athletes in this thesis and athletes described in the literature appeared to share similarities with respect to beliefs, behaviours, and personality factors associated with risk for overtraining. Wrisberg and Johnson (2002) provided quotes from an overly motivated college tennis player who appeared to believe that he always had to push himself harder, disregarding any physical limitations, such that he pushed himself until the point of injury several times. Similarly, a number of athletes represented in Steve, John, and Jane's stories could have been characterised as super-motivated, holding beliefs that training harder, even in the face of pain and serious injury, was the way to be successful in their sports. In John's story, one athlete had mentioned that one of the mantras to which he subscribed was *rest is for the dead*. Wrisberg and Johnson also presented quotes from a runner who believed that taking a day off was equivalent to being weak. Likewise, in Jane's story, an athlete suggested that taking extra recovery was a sign of weakness; she loathed days off, and tried to avoid complete rest days at all costs.

In terms of personality traits, numerous athletes who had experiences with overtraining described themselves as perfectionists. Scanlan et al. (1991) quoted an elite figure skater who talked about the perfectionist attitudes driving her: "I was a perfectionist. . . . I would never accept myself not doing it perfectly" (p. 115). Several athletes in Jane's story also talked about perfectionist tendencies, and wanting to have perfect relationships. These athletes' strivings for perfection illustrated how the pursuit of an ideal fuelled overtraining behaviours. On a deeply personal level, both the Krane et al. (1997) gymnast

and an athlete in Jane's story talked about resorting to overtraining and self-harming, perhaps as compensatory behaviours to cope with existential angst. The gymnast had said, "I purposely hurt myself to make myself better, to make myself feel like I was existing" (p. 65). In a similar vein, an athlete in Jane's story had said, "I don't have many other things; so I was overtraining myself. . . . At least it will take my mind off how bad other stuff might be." It sounded like the athletes in both of these cases were struggling with similar issues, trying to use sport to heal their feelings of emptiness. Both of these athletes, however, tried to make themselves better through self-harm and overtraining, methods that they had learned from their coaches and parents. These athletes saw themselves as people who could endure more than others, even if such attitudes and their corresponding behaviours led to the athletes' ultimate downfalls.

Looking at a number of these personal characteristics and behaviours, I feel a need to offer a caution about interpreting athlete characteristics as risk factors for overtraining. As mentioned previously, the story of Jane highlighted athletes who appeared to be driven to overtraining from within, but who developed these internal drives during their formative years when trying to appease the often abusive demands and garner the contingent love and approval of parents and coaches. With this caution in mind, I think that it could be useful to assess the personal characteristics of athletes that might make them susceptible to overtraining, while maintaining awareness for the origins of those characteristics. Steve, John, and Jane's composites showed that athletes' personality factors, behavioural tendencies, and personal beliefs are hugely significant in understanding susceptibility to OT. Nonetheless, understanding what created these factors, tendencies, and beliefs in the first place (e.g., the influences of coaches and parents) is equally important.

Summary of Study 2 Results

Conceptualising overtraining seems to require developing a complete picture of athletes' lives. Through the stories within this thesis, of athletes' experiences with overtraining and the factors that drove them to overtraining, I hope I have added some substantial texture, colour, and richness to this picture. Botterill and Wilson (2002) stated, "since the phenomena involved in overtraining and recovery are clearly multifactorial, qualitative descriptive case studies and research can assist us in understanding the complex relationships involved" (p. 143), and the aggregate case studies presented in this thesis were aimed at enhancing understanding of the overtraining phenomena. Where the experts' opinions in Study 1 provided a broad overview of the risk factors, the athletes' stories provided depth and insight, which could assist in understanding some of the less well-known drivers of overtraining. All three composite stories are about athletes who had tremendous success in their sports throughout their careers, but their encounters with overtraining emphasised the delicate balancing acts between stressors and recovery, which often resulted in devastating outcomes. As mentioned previously in the literature review, Armstrong and VanHeest (2002) stated, "the border between optimal performance and performance impairment due to overtraining is subtle" (p. 341). In Steve, John, and Jane's stories I tried to provide numerous illustrations of times where athletes crossed the boundary from peak performance to overtraining, possibly costing them world titles or Olympic glory, but more significantly, costing them physical and emotional well-being. It appears that athletes will cross that boundary for a number of different reasons. Steve, John, and Jane's stories highlighted three different patterns of what drives athletes to overtraining. In one, it is the footballer driven primarily by the professional sports machine; in the next, it is the triathlete driven mostly by the seduction of Olympic glory,

and in the third, it is the gymnast/cyclist driven fundamentally by desperate attempts to win love and affection from her coaches and parents.

Considering the statement, “only the individual athlete knows exactly in which way the training affects her body and mind and how she perceives recovery actions” (Kenttä & Hassmén, 2002, p. 67), it seems imperative that coaches, parents, administrators, and others initiate healthy discourses with athletes about risks for overtraining. In the context of the athlete stories in this thesis, having open communication about how training is affecting athletes, and having supportive people around the athletes to encourage such communication, are important for dealing with the risk for overtraining. Athletes who do not feel supported might not tell the coach how they feel, ignore the signals from their own bodies or, as in Jane’s story, become good at blocking out the seriousness of injuries, fatigue, or illness.

Kenttä and Hassmén (2002) had stated “performance development and optimal training depend heavily on the ability to integrate and react to as many relevant variables as possible” (p. 67). In all three stories, many of the variables affecting performance, recovery, and fatigue, had been completely ignored to the obvious detriment of the athletes. Only by increasing awareness and understanding for these numerous personal and situational variables, might coaches, athletes, parents, and sport psychologists begin to understand the variability among different athletes’ responses to the same training stimuli, and why some athletes are more vulnerable to overtraining than others.

This issue of identifying predisposing personal variables leads me to think about the athlete I primarily used for Jane’s relationship to Aaron, her last coach. In this instance, she was not pushed by Aaron to overtrain, like with her other coaches, but she overtrained anyway, against his better advice. So in this case, even under a coach with a more balanced approach, Jane could not make adaptive decisions about training and recovery. The

overtraining mentality inherited from her previous coaches, and from her Mum, seemed inescapable. The challenge to researchers and practitioners is to look at ways of offering an escape from the seemingly inescapable for these athletes at risk.

CHAPTER 7: GENERAL DISCUSSION

In writing this final discussion, I have felt exceedingly challenged with the tasks of bringing together the results of the experts' and athletes' interviews, and of presenting a clear picture of risk factors for OT. I have gained an appreciation for the work of other researchers and authors who have attempted to depict the complexity of OT in conceptual models (i.e., Kenttä & Hassmén, 1998, 2002; Meyers & Whelan, 1998), and I hope that I may add to the literature by expanding on the work of these researchers and by presenting a descriptive model of OT risk factors, processes, and outcomes. In the following sections, I present a synthesis of Studies 1 and 2, uniting, as much as possible, the perspectives of the experts with the experiences of the athletes. I then present a model of OT risk factors, processes, and outcomes based on the expert and athlete interviews, and I critically reflect on the OT conceptual models of Meyers and Whelan (1998) and Kenttä and Hassmén (1998, 2002). Finally, I present the conclusions of my research and reflect on methodological issues, future research, implications for professional practice, contributions to the literature, and the implications this work has for me as a researcher, practitioner, and athlete.

Synthesis of Experts' Perspectives and Athletes' Experiences

In general, the results of the experts' interviews provided a template for understanding the broad range of potential OT risk factors, whereas the results of the athletes' interviews provided in-depth illustrations of a smaller number of those risk factors affecting individual athletes. The experts provided a comprehensive list of significant personal and situational risk factors, and the athletes described the personal, and sometimes painful, experiences of overtraining, with which I identified and hoped others would as well. The athletes' stories contextualised the risk factors outlined by the experts, providing glimpses of the dynamic, complex interactions among people, situations, and

socio-cultural factors that influence overtraining behaviours and outcomes. The athletes' stories also provided a sense of the omnipresence of overtraining pressures, and presented illustrations of both the explicit and implicit influences that constantly drive athletes' behaviours.

Reflecting on the most salient factors emerging from Studies 1 and 2, both experts and athletes emphasised the roles of coaches and parents in instigating, teaching, reinforcing, and maintaining OT behaviours, and highlighted the position of injury as both cause and consequence of OT processes. Furthermore, both experts and athletes illustrated how coaches and parents could be key drivers of maladaptive behaviours surrounding injuries. With respect to the significance of injury and illness issues in overtraining, O'Toole (1998) commented on the misattribution of causes of injury and illness in sport:

Increased susceptibility to musculoskeletal injury or infections, such as head colds, may be indicators of a state of overreaching or overtraining, but may be misinterpreted as isolated, local problems rather than manifestations of the overtraining syndrome. (p. 13)

In light of the experts' and athletes' emphases on injury in OT, and significant comments about illnesses, the previous statement seems even more relevant to me now than at the outset of my thesis. Perhaps most researchers would acknowledge that injury and illness are significant sequelae of overtraining, but I have come to the conclusion that injury might be the most common outcome of overtraining processes.

This interaction between the dynamic influences of parents and coaches and the OT outcomes of injury and illness also highlights the significance of psychosocial mediators of athletes' behavioural responses to potential OT situations. In discussing markers of OT in Study 1, the experts pointed out that often athletes who experience the outcomes of OT will become emotionally distressed and reactive, which leads them to poor decision-making in response to the adverse outcomes, and might prompt continued OT behaviours. One expert in Study 1 had referred to such maladaptive coping by athletes as the *need-to-*

please-disease. The athletes' stories also illustrated how athletes' anxieties about what parents, coaches, and others think of them might lead them to respond desperately, with maladaptive behaviours, to injuries, illnesses, and other setbacks.

Despite obvious overlaps in the experts' and athletes' descriptions about parents and coaches, and issues surrounding injuries, there were differences in the level of detail emerging from Studies 1 and 2. The Study 1 results mostly gave a sense of what OT risk factors to look for in athletes in the *here and now*, whereas the Study 2 stories emphasised the athletes' unique ontogenetic histories for understanding OT risk. The characteristics and experiences of the athletes making up Steve, John, and Jane's tales shed light on the depth and breadth of pathogenic processes in athlete behaviours instigated, promoted, and maintained by parents and coaches. The athletes whose stories were the bases for these three tales also exemplified how individuals turn to competitive sport in attempts to escape their own feelings of inadequacy and emptiness, look to success at major sporting events to elevate their senses of self-esteem, and are driven by cultural and sub-cultural imperatives dominant in their sports, society, the media, and in the discourses of parents, coaches, and teammates.

Looking at Studies 1 and 2 together, I sense that the integration of experts' and athletes' results could enhance understanding for past and present experiences with OT processes and outcomes, and help to predict possible future responses to OT situations. I hope that this research might help to answer my original research questions about why athletes overtrain, and might continue to do so, even in contradiction to balanced guidance. In conducting OT risk assessment, one might gather information on what happened in an athlete's past that led to the development of OT behaviours in the first place, and then ask what is going on in the present to drive or maintain such behaviours. In particular, one could look at circumstances that elevate stress (requiring increased recovery), or motivate

increases in training (also requiring increased recovery), and the influences that reinforce or maintain maladaptive responses to stress/recovery imbalances, injury, illness, or other setbacks. Finally, one could ask, how might one anticipate future responses to OT situations?

Initially, after completing the interviews, I had the sense that OT could be broken down into two major categories: personal and situational risk factors. The personal risk factors would be about what the athletes *bring to the table*, and the situational risk factors would be about what aspects of their environments push athletes to overtrain. With a shift away from identifying physical training as the only stressor that leads to overtraining, to identifying a whole range of training and non-training stressors, as well as factors associated with underrecovery, as emphasised by Kenttä and Hassmén (2002), Kellmann (2002), and others (e.g., Lehmann et al., 1997), it became apparent that these two categories (i.e., personal, situational) were not specific enough, as overarching dimensions, to depict OT risk factors. Trying to focus on the central issues emerging from my research, I started to conceptualise OT risk factors in terms of intra- and interpersonal, situational, and socio-cultural influences, past and present, on athletes' behaviours. I also could see that all of these influences interacted in ways that could either motivate or push athletes to increase training, or create circumstances that demanded increased recovery, as indicated in the general dimensions of the experts' OT risk factor list. In the next section, I attempt to depict these OT risk factors, the processes they influence (and are influenced by), the responses to those processes, and the potential outcomes in a dynamic OT model.

The OT Risks and Outcomes Model

Introduction to Modelling OT Risk Assessment

In trying to depict a model of OT risk factors, processes, responses, and outcomes, I have spent substantial time struggling with how I might illustrate the different aspects of

the model schematically and parsimoniously, while preserving the complex, dynamic, and interactive qualities. I have drafted numerous network diagrams and flow charts by hand, shifting from the convoluted and confusing to the brief and simplistic. At one point, I thought that I had settled on a temporal model describing risk factors within the framework of an athletic season, but following the advice of one of my supervisors, I decided that the temporal element could be limiting. Consequently, I have worked out a general descriptive model of OT risk factors, processes, responses, and outcomes, which I will refer to as the *OT Risks and Outcomes Model*, but have followed it up with a description of how the model might be applied, temporally, across an athletic season.

Background to the Model

In developing a general model of OT risks and outcomes, I was cognisant of integrating the experts' and athletes' results, at the same time as being mindful of the extant literature on OT. With respect to the literature, as mentioned in Chapter 2, researchers have focussed on trying to identify markers of OT syndrome (e.g., Hooper & McKinnon, 1995; Uusitalo et al., 1998), potentially limiting them to looking at the immediate states of athletes' fatigue. These limitations might not have allowed researchers to develop a broad picture that includes what athletes bring to any training situation from their personal histories. The focus on immediate fatigue states also might have limited researchers to questions that did not involve: how athletes could be expected to respond during times of increased stress, how athletes normally cope with injury, fatigue, or illness, or what activities athletes engage in on their own time outside of the coaches' programs. Answering the question about what drives athletes to overtrain seems to require in-depth life histories, which reveal attitudes and behaviours toward training and recovery learned during formative years in sport. Gathering such detailed information could shed light on past experiences with, and responses to, injury, illness, and fatigue. Furthermore,

conducting biographical analyses of athletes could illuminate common behaviours surrounding OT, perceived external pressures to engage in OT behaviours, and struggles with unfulfilled needs, which athletes are trying to satisfy by being in competitive sport.

In bringing together the athletes' and experts' results, it became apparent that assessment of OT risk would be an ongoing process, influenced by dynamic interactions of past experiences, athlete characteristics, and situational pressures. Furthermore, these interactions take place within a socio-cultural context, which underlies and influences decision-making and behaviour with respect to OT.

In developing the *OT Risks and Outcomes Model*, I referred to the OT risk factor list from the expert interviews in Study 1 to provide an outline for exploring past and present personal characteristics and situational variables that put athletes at risk for overtraining. From the athlete interviews, I was guided to represent athletes' past experiences with coaches and parents in the model, as well as depicting the influences of such others on athletes' responses to current training and recovery situations. I was also guided to include illustrations of the pressures inherent in sport cultures.

Describing the Model

The *OT Risks and Outcomes Model* is illustrated in Figure 2. I have divided it into four parts: (a) Risk Factors, (b) Processes, (c) Responses, and (d) Outcomes. I discuss each of the parts of the model in the next four sections.

Risk Factors

The first part of the model shows the major categories of OT risk factors in dynamic interactive relationships that influence athlete beliefs and behaviours, and lead to OT processes depicted in the second part of the model. In Study 1, I had originally divided OT risk factors into athlete characteristics, situations that pressure athletes to increase training, and situations that affect athletes' needs for recovery. In synthesising the experts' opinions from Study 1 with the athletes' stories from Study 2, however, it seemed that these original divisions did not capture the way the dynamic interactions among different systems influenced athlete behaviours, which I hoped to depict. To assess the OT risk of any particular athlete, it seemed that I could start by looking at the athlete's characteristics, behaviours, and beliefs. To gain further insight into why the athlete behaved in certain ways, or held particular beliefs, with respect to training and recovery, I could then look at how past and present, interpersonal and situational, factors were influencing the athlete's behaviour. Finally, in completing risk assessment, it appeared important to acknowledge the potentially strong influences of the socio-cultural context in which the athlete behaviours, interpersonal influences, and situational factors were embedded. In trying to represent a comprehensive picture of the many different factors and interactions affecting OT processes, I labelled the major categories of risk as the following: (a) athlete intra-personal variables, (b) interpersonal influences (from coaches, parents, and significant others), and (c) situational factors (which can arise at any time), and showed them as being nested in (d) a socio-cultural context. It also seemed important to show that the different categories of influences could either motivate an athlete to increase training, or increase demands for recovery, both creating circumstances that could upset an athlete's stress/recovery balance (illustrated in the model by the changes in shading of the risk factor circle and the increased training/decreased recovery labels). Furthermore, for any

athlete at any given time, one or more of these categories could have variable and disproportionate influences on OT processes. Unfortunately, such temporal variations could not be shown in a static, two-dimensional diagram. For example, in Study 2, despite overlap among themes in the three stories, there were examples of different primary drivers of OT: in Story 1, athletes were driven by the tough cultures of professional sport; in Story 2, athletes were spurred on by upcoming Olympic Games, and in Story 3, athletes were pushed excessively by parents and coaches.

Processes

The second part of the model represents the processes that evolve from the interactions among intra-personal, interpersonal, situational, and socio-cultural influences, and which lead to initial imbalances between stressors and recovery. Monitoring these initial phases of stress/recovery imbalance could include paying attention to: increasing levels of fatigue, unexpected decreases in performance, evidence of minor niggles, pains, muscle soreness, colds, and infections, and changes in physiological and psychological markers. According to the experts in Study 1, one could use a number of different markers when assessing athletes' current physical and psychological states. The experts had suggested evaluating current physical states by looking at unexpected negative changes in performance patterns, assessing any possible physiological markers associated with increased stress, such as changes in resting heart rates, and checking for any changes in routine, sudden weight loss or weight gain, evidence of minor injuries, infections, prolonged fatigue, and counterproductive biomechanical or technique changes. The experts also suggested evaluating athletes' current psychological states by observing them for emotional distress or reactivity, fears of failure, guilt about missed or reduced training, and anxiety around communicating to coaches or others about fatigue, injury, illness, or other

stressors. Experts from Study 1 also emphasised using OT markers, not as conclusive evidence of OT, but as starting points to investigate the possibility of OT processes.

Responses

The third part of the model represents how athletes respond to the initial experiences of OT processes and stress/recovery imbalances. The green and red arrows on the model from Part 1 (large blue oval), combining with the arrows from Part 2 (yellow oval), and feeding into Part 3 (green and red ovals), are meant to show that athletes' behavioural responses to OT processes and stress/recovery imbalances are mediated by psychosocial factors from Part 1. In other words, how athletes react to initial signs of excessive stress or fatigue is determined by what they believe, what they have experienced, how they are being influenced by others, what situations might limit or motivate them, and how they are predisposed by socio-cultural factors. It is conceivable that some athletes might have quite balanced approaches to training and recovery, and that they might also have people around them with similarly adaptive approaches. Nonetheless, when significant events, such as national selection trials, World Championships, or Olympic Games loom in the near future, such balanced athletes could be driven to push harder than they did previously, with the result being that they engage in maladaptive behavioural responses to stress recovery imbalances, and consequently suffer adverse outcomes. In other cases, athletes could be driven to maladaptive behavioural responses because of abusive coaches or parents, or because of the constant barrage of cultural imperatives present in the sporting world, in the media, and in other forms of communication.

Outcomes

The fourth part of the model represents the potential outcomes of the athletes' responses to stress/recovery imbalances. In the event of adaptive responses to initial stress/recovery imbalances (green oval), athletes would conceivably return to balance

between their stressors and recovery. The green arrow feeding back to Part 1 from the adaptive responses oval suggests that the experience of an adaptive outcome could have an influence on future interactions of risk factors. In the event of maladaptive behavioural responses, which are mediated by the psychosocial influences from Part 1, to initial stress/recovery imbalances, athletes would likely spiral downwards to more serious adverse outcomes, including substantial performance decrements, injuries, illnesses, psychological distress (e.g., anxiety, depression), and fatigue syndromes (described as OT syndrome or chronic fatigue). I have divided the outcomes of maladaptive responses into less and more severe outcomes. The idea here is to show that, with some injuries, illnesses, minor psychological distress (e.g. depressed mood, mild anxiety, psychosocial withdrawal), and some levels of fatigue, athletes might still continue to train, albeit with difficulty. These adverse outcomes could then become new situational risk factors influencing future OT behaviours and beliefs, depicted by the red arrow looping back to Part 1. These setbacks could also be seen to drive further OT processes and responses, thus adding to vicious cycles of negative influences, OT processes, responses, and adverse outcomes. With more serious injuries, illnesses, psychological distress (e.g. full-blown depression, debilitating anxiety disorders, social isolation), or experiences of fatigue syndromes, depicted in the final level of maladaptive outcomes, athletes could be forced to take complete breaks from training, often for prolonged periods of time, and in some cases might be forced into retirement from competitive sport. In the worst case, with severe depression from a loss of identity and meaning in their lives, athletes could turn to suicide as a final and tragic outcome.

Describing OT Risk Assessment within a Temporal Framework

In the following sections, I have attempted to describe an application of the *OT Risks and Outcomes Model* for OT risk assessment using a temporal framework.

Understanding athletes' beliefs and behaviours surrounding overtraining, as well as understanding interpersonal, situational, and cultural influences on those beliefs and behaviours, could be part of a year-long approach to OT risk assessment, monitoring, and intervention. One could look at OT risk assessment as an ongoing process throughout athletes' training cycles. For this example, I have tried to describe OT risk assessment for individual athletes in different scenarios across a competitive year, starting with the commencement of training after an off-season break.

In conceptualising risk assessment for OT, I hope to simplify the ongoing dynamic interplay of influences by dividing risk assessment into four possible scenarios in an athlete's year: (a) when planning training and recovery strategies at the commencement of a new season, (b) when monitoring stressors and recovery activities and adaptations throughout the training cycle, (c) when responding to the first signs of stress/recovery imbalance, and (d) when responding to setbacks, such as injuries, illnesses, psychological distress, and excessive fatigue states, if they were to occur.

Planning Training and Recovery

At the beginning of a new season, starting a new training cycle, athletes could be assessed by what they *bring to the table*. Questions posed to athletes at this point could be focussed on their attitudes toward training and recovery, their past interactions and relationships with coaches, parents, and significant others, their past histories with injury, illness, and fatigue, their past training programs and responses to them, their expectations about progression in the sport, their perceptions of others' expectations of them, their current levels of fitness, including any chronic injuries or illnesses, and their current states of physical development (e.g., young athletes going through growth changes, or older athletes dealing with reduced recovery capacities). The idea here would be to get a picture of what athletes can tolerate currently in terms of training load, and how athletes might be

expected to respond to different outcomes of training and recovery throughout the year. For example, in the event of new injuries, having knowledge about athletes' past responses to injuries, which might have involved anxious attempts to return too early to training, could help coaches, doctors, or sport psychologists guide athletes in effective rehabilitation processes, and to encourage timely, rather than premature, returns to sport.

Initial risk assessments at this time of the season, based on the intra-personal, interpersonal, and situational risk factors presented in Study 1, highlighted in Study 2, and depicted in Part 1 of the model, could set the stage for monitoring of, and early intervention in, athletes' overtraining behaviours as the season progresses. One could refer to the OT risk factor list from Study 1 as an outline to guide exploration of an athlete's past, and augment this list with the themes emphasised in the athletes' experiences portrayed in Study 2. The athletes' stories, especially those depicted in Jane's tale, highlighted the importance of assessing past experiences with sport, and the perceived roles of coaches and parents in those experiences, when looking at risk for overtraining. The stories illustrated how athletes might continue to overtrain because of maladaptive coping mechanisms learned from the past to deal with demanding parents and coaches, despite coming under the new leadership of balanced coaches who encourage adequate recovery. In these situations, with knowledge of athletes' beliefs about overtraining and recovery, new coaches might be better equipped to develop positive communication with athletes that helps them overcome some of their overtraining patterns.

Monitoring Stress and Recovery

In Study 2, it was evident that risk for overtraining was an ongoing issue throughout the season. Thus, it could be important to carry out risk assessments, periodically, as the training cycle continues. This phase of monitoring could involve vigilance directed at situational variables, outlined in Study 1, which increase risk for

overtraining, both those that motivate athletes to push harder, and those that affect athletes' recovery needs. Any time that decisions have to be made about changes in training and recovery activities, it could be important to consider how athletes might have normally responded in the past, which influences how they are likely to respond in the present. Such considerations might include anticipating high-risk situations and preparing to make adaptive decisions when such situations arise. This phase is about risk assessment when novel situations or events arise that might affect OT behaviours.

Responding to Stress/recovery Imbalances

From listening to the athletes' stories in Study 2, there appeared to be sensitive periods during training when things started to become slightly imbalanced. How they responded to these initial stages of imbalance often set them up to move to more serious stress/recovery imbalances. This phase, thus, is about assessing how athletes will respond when stressors first start to exceed recovery capacities. When athletes start to build up levels of fatigue, experience small decrements in performance, have mood and behavioural changes, and develop minor niggles, infections, or other symptoms of stress/recovery imbalances, during the training cycle, it could be important to refer to information gathered at the commencement of the season about intra-personal, interpersonal, and situational OT risk factors. Knowing how athletes think and feel about themselves during times of duress could be helpful because these early stages of stress/recovery imbalances are crucial times for coaches and athletes to make sound decisions about training and recovery. If coaches and athletes respond to these early stages of imbalance with anxiety and desperation, hoping that hard work will overcome any of the problems, the results might be that the athletes spiral downward to more extreme overtraining, injury, psychological problems, and other adverse outcomes.

Responding to Setbacks

Common themes in Study 2 were that, when faced with significant setbacks, such as illness, injury, or excessive fatigue, many of the athletes became anxious and attempted to block out the possible consequences of those setbacks, ignored the signals in their bodies telling them to recover more, and pushed for early returns to full training, often training and competing with serious pain or debilitation. Thus, it could be worth considering re-assessment and monitoring of athletes' OT risk right at the time when the setbacks occur. Risk assessments in these situations might help coaches and athletes minimise the chances of repeating the behaviours that had resulted in the initial setbacks, or help them make the most effective decisions about rehabilitating and returning to full training. Risk assessments in these situations could also provide more information for sport psychologists to address the psychological sequelae of OT within a psychotherapeutic context.

Conclusions on the OT Risks and Outcomes Model

Looking at the *OT Risks and Outcomes Model*, and four possible time frames during which one could assess risk throughout an athletic season, it appears that OT risk could be seen as an ongoing issue in athletes' lives. Throughout their careers, athletes' are continually influenced by the interactions of their current experiences with attitudes and behaviours formed from past experiences; these interactions form new patterns of behaviours, as well as reinforce old ones, both adaptive and maladaptive.

Comparing the OT Risks and Outcomes Model to Current Conceptual Models of OT

In the following sections, I provide outlines of the Meyers and Whelan (1998) and Kenttä and Hassmén (1998, 2002) models of OT and then compare them to the *OT Risks and Outcomes Model*. The former two models are stress-adaptation models, and both are aimed at conceptualising processes that lead to OT syndrome.

Multi-Systemic Model (Myers & Whelan, 1998)

Meyers and Whelan (1998) described a systemic, stress-adaptation model of OT that illustrates the importance of understanding multi-contextual sources of stress in athletes' lives, effects of athletes' experiences in one context on experiences in another context, and influences of interrelationships among athletes, other people, and different environments. Meyers and Whelan discussed their systemic model in terms of "building a framework for understanding why competitors with similar physical skills and capabilities, exposed to almost identical training regimens, may demonstrate widely variable outcomes" (p. 336). Meyers and Whelan advocated that an understanding of the OT stress experience requires consideration of the functioning of individual athletes in complex systems. Referring to Murphy's (1995) multi-contextual model of individual functioning, they suggested that it is necessary to consider many of the environmental contexts in which athletes operate, including training and competition, along with social, familial, and cultural contexts, and how these contexts interact to influence athletes and their behaviours.

Figures 4 and 5 from Meyers and Whelan depict several of the systems surrounding athletes in both sport and non-sport contexts. Meyers and Whelan pointed out that challenges or threats might originate within any context and within any system, and produce stress that can influence behaviour in any other system or context. They stated "An athlete's failure to perform may be due to a myriad of interacting influences. Consequently, understanding the athlete's performance requires consideration of both sport and extra-sport contexts" (p. 349). Thus, understanding the overall impact of a stressor within the multiple contexts is central to understanding any potential OT issues presented by an athlete.

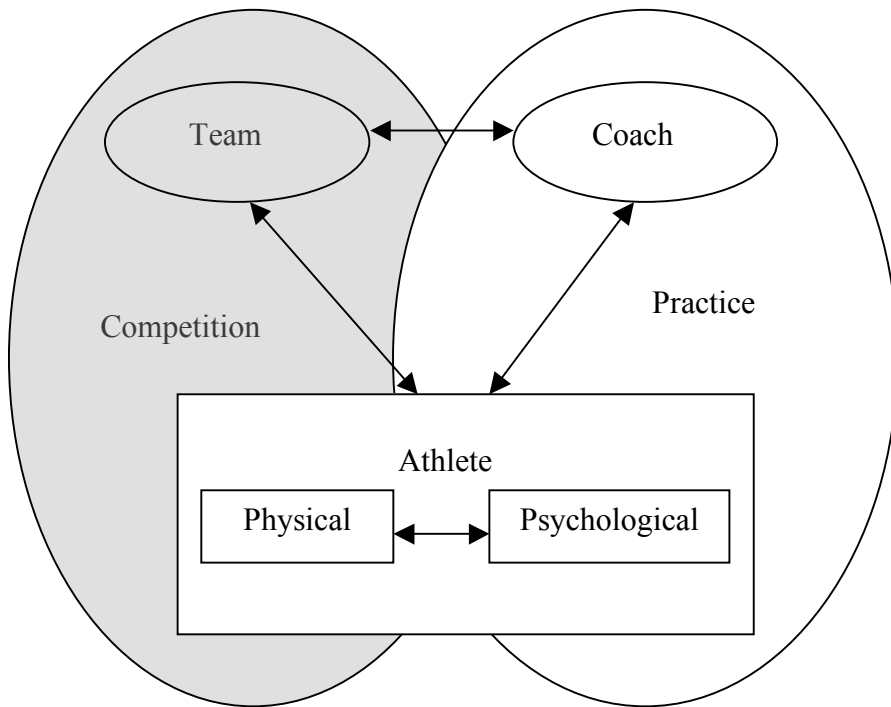


Figure 3. Systemic View of the Athlete in Sport Contexts (adapted from Meyers & Whelan, 1998)

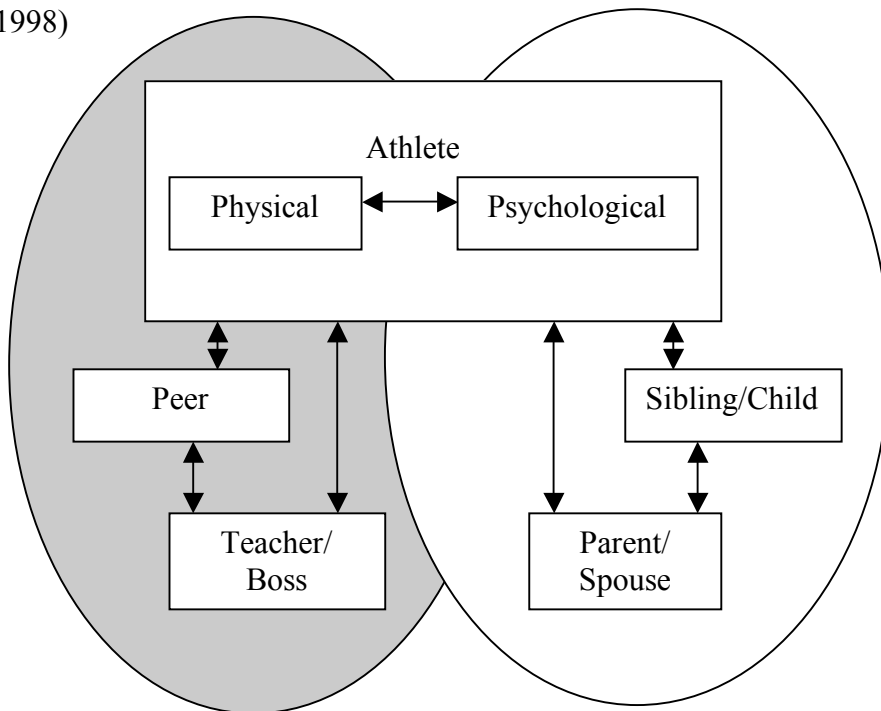


Figure 4. Systemic View of the Athlete in Non-Sport Contexts (adapted from Meyers & Whelan, 1998)

Although Meyers and Whelan discussed the impact of stressors within *present* systems and contexts, they also noted the significance of *past* events and experiences, suggesting that it is important to recognise the life experiences and personal histories that athletes bring to any training situation. Furthermore, Meyers and Whelan commented on the cultural context in which systems are embedded, suggesting that within the context of overtraining “society, culture, politics, and economics all have some effect on the athlete” (p. 350).

In general, Meyers and Whelan presented a descriptive OT model aimed at increasing awareness for the multiple sport and non-sport contexts in athletes’ lives, which influence OT processes and bring about OT outcomes. The model depicts the overarching systems or contexts that are important to consider in understanding OT, including athletes’ past histories, present sources of stressors, experiences of interrelationships among current sport and non-sport contexts, and interactions with other people.

Conceptual Model of Overtraining (Kenttä & Hassmén, 1998, 2002)

Kenttä and Hassmén’s (1998, 2002) model of underrecovery and OT, depicted in Figure 5 seems to capture factors and processes similar to the Meyers and Whelan model by depicting interactive, multi-systemic influences on OT processes and OT syndrome. Kenttä and Hassmén, however, proposed a more practical model than Meyers and Whelan’s, which they designed to be used for assessing athletes’ current states of adaptation to stressors. Similar to Meyers and Whelan, Kenttä and Hassmén aimed specifically at conceptualising the factors that lead to OT syndrome, which they labelled *the staleness syndrome*. To describe OT, Kenttä and Hassmén referred to the definition by Lehmann et al. (1993) of overtraining syndrome as “an imbalance between training and recovery, exercise and exercise capacity, stress and stress tolerance [in which stress is considered] the sum of training and non-training stress factors” (p. 7).

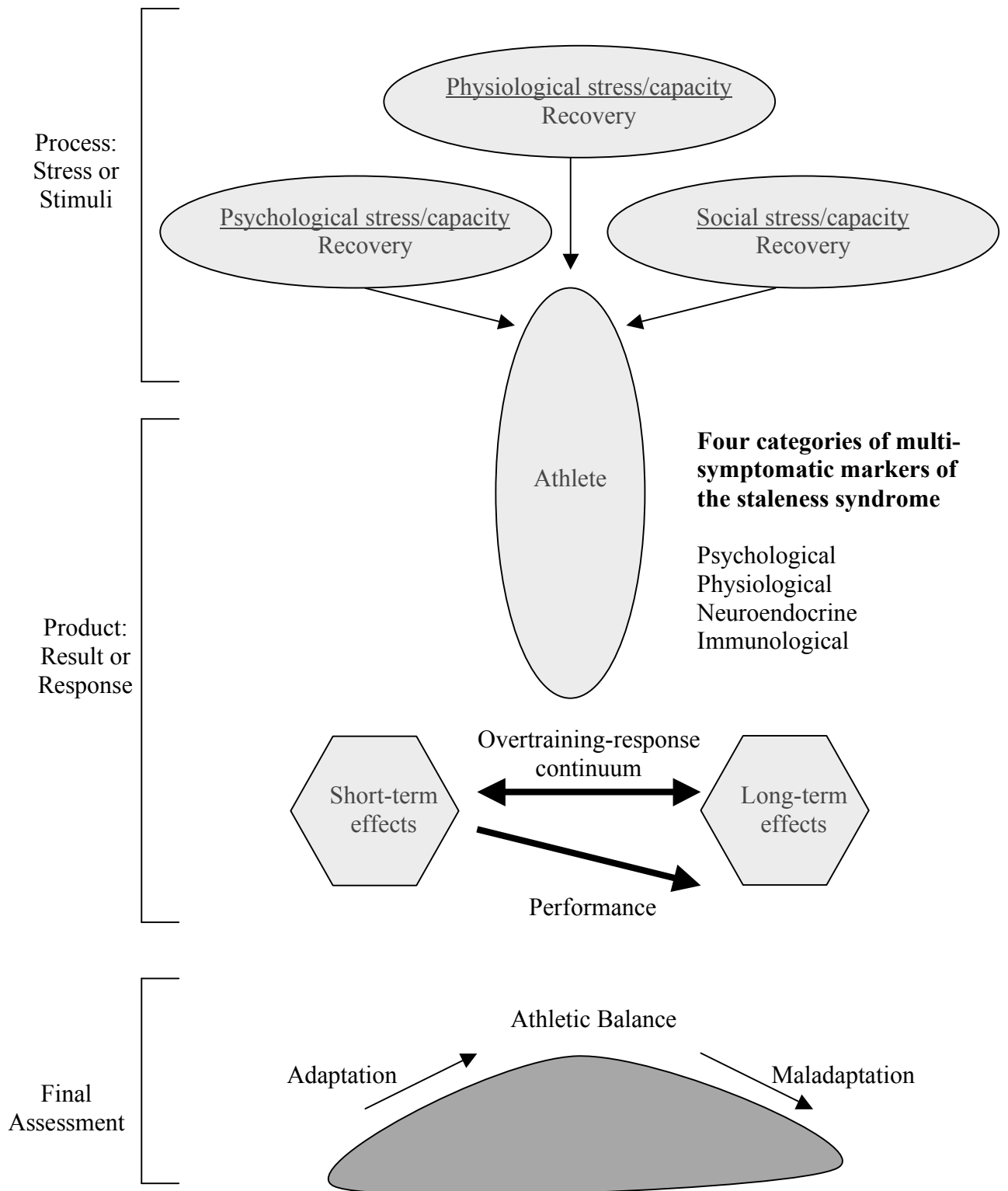


Figure 5. An Overview of the Whole Overtraining and Recovery Process (adapted from Kenttä & Hassmén, 1998, 2002)

In their model, Kenttä and Hassmén defined OT processes in terms of interactions among three major subsystems, psychological, physiological, and social. They suggested that within each of these systems, three components interact to affect the overall balance between stress and recovery. These three components are stress, stress capacity, and recovery. Kenttä and Hassmén gave examples of how the components can be broken down into sub-components. For example, neuromuscular capacity is described by aerobic and anaerobic energy production, general strength, specific strength, and technique; capacity for psychological stress is described by level of self-confidence, capacity to cope with anxiety, attentional capacity, motivational level, attitude control, positive mental health, and visualisation skills, The capacity to handle social stress is described by ability to create, negotiate, and maintain relationships with others.

In the Kenttä and Hassmén model, the interaction of the many processes leads to responses and outcomes that can be assessed along a continuum moving from adaptation to maladaptation. Looking at this continuum, Kenttä and Hassmén (1998) summarised the specific aim of their model in monitoring OT and recovery processes:

The aim of monitoring training and adequate recovery in the elite athlete is to reach a balance in the zone where training yields optimal increases in performance. . . . We suggest that this optimal zone be defined as the *adaptation threshold*. Theoretically, the adaptation threshold is the dynamic ‘breaking point’ where adaptation suddenly becomes maladaptation. Together, recovery, stress, and capacity can be viewed as three variables affecting the adaptation threshold. Thus, the need to identify the individual’s dynamic threshold can be seen as the overall goal in monitoring training and recovery. (p. 13)

Kenttä and Hassmén suggested that the way to remain in the optimal zone of adaptation, or to increase the adaptation threshold, is for athletes to optimise recovery activities and improve stress tolerance (they suggested that reductions in training loads for elite athletes are generally not feasible). They outlined three approaches to optimising recovery: (a) matching recovery activities with the specific type of stressor; (b) improving specific capacities, such as coping skills, to effect improvement in stress tolerance; and (c)

minimising psychological and social stressors. They also suggested monitoring symptoms and markers of overtraining to aid any decisions about alterations in the training program.

Kenttä and Hassmén's (1998, 2002) model appears to be about assessing OT syndrome *right now*. The model provides a conceptual, holistic approach to determining an athlete's present status and current levels of stressors, capacities, and recovery activities. The model is about providing answers to the following questions: How can one identify if an athlete is becoming overtrained, or is developing a stress/recovery imbalance? Is it OK for an athlete to continue his or her training schedule? The answers to these questions are found in monitoring and evaluating the three OT processes (physiological, psychological, and social stressors, recoveries, and capacities) and associated symptomatic markers.

OT Risks and Outcomes Model vs. Multi-Systemic and Conceptual Models

Meyers and Whelan (1998) originally laid the foundation for considering multiple contexts influencing OT syndrome by depicting interactions among general variables in both sport and non-sport contexts. Kenttä and Hassmén (1998, 2002) offered a more focussed, practical assessment model illustrating how physiological, psychological, and social systems, and their subsystems, might interact to upset athletes' stress/recovery balances and result in OT syndrome. With the *OT Risks and Outcomes Model*, based on the findings of my research, I attempted to broaden perspectives on OT by including risk factors, processes, responses, and multiple OT outcomes in one model. I tried to illustrate that OT processes lead not only to fatigue syndromes, such as OT syndrome, but also to illness, injury, and psychosocial sequelae. I also attempted to incorporate themes and categories, derived from expert and athlete interviews, into the components of the risk model, providing specific examples of variables that make up OT risk factors, processes, responses, and outcomes. With the *OT Risks and Outcomes Model*, I hoped to augment previous research on identifying OT processes and outcomes with an increased

understanding of *why* athletes engage in overtraining behaviours, and what might influence them to continue engaging in those behaviours, even when they receive support and encouragement to balance their stressors and recoveries.

The most substantial part of the *OT Risks and Outcomes Model*, risk factors, shares similarities with both the Meyers and Whelan and the Kenttä and Hassmén models. The interactions I depicted among athlete intra-personal variables, interpersonal influences, situational variables, and socio-cultural influences parallel the structure underlying Meyers and Whelan's and Kenttä and Hassmén's perspectives, in which they described OT processes as being functions of the interactions among multiple systems and contexts. Nonetheless, the novel contribution of the *OT Risks and Outcomes Model* is the emphasis placed on *past* formative experiences that drive OT behaviours and processes, especially the psychodynamic influences of parents, coaches, and significant others. Furthermore, the model is aimed at providing specific examples, albeit without being exhaustive, of variables that have been shown, from the research, to influence OT processes and outcomes. In a sense, the results of this thesis provide specific detail about the numerous possibilities of stressors and influences that fit within the overarching contexts of Meyers and Whelan's model and within the psychological, physiological, and psychosocial sub-components of stress and recovery of Kenttä and Hassmén's model.

Although Meyers and Whelan discussed the influences of coaches and parents, and suggested deeper psychodynamic drivers of overtraining behaviour, their model leaves it up to the reader to determine how and why these drivers lead to overtraining. I think that Meyers and Whelan presented a model designed to stimulate more research into the multi-systemic context of OT syndrome, and perhaps push future researchers to search for answers to these *how* and *why* questions. Their conceptual model helped me develop my

research ideas, and I was motivated to find answers to their questions regarding what distinguishes one athlete from another in susceptibility to OT syndrome.

The processes part of the *OT Risks and Outcomes Model* is reflective of Kenttä and Hassmén's model, in that it represents the current level of adaptation occurring in an athlete. Similar to Kenttä and Hassmén's model, understanding the OT processes involves monitoring of physical and psychological variables in athletes. The added component of my model is the emphasis on the constant influence of the risk factors that underlie these OT processes. That is not to say that Kenttä and Hassmén did not emphasise the influence of multiple interacting variables, because they did discuss such influences. Rather, Kenttä and Hassmén appeared to emphasise the athletes' present states, without much reference to past experiences and dynamic influences on motivation and decision-making. The current model is about expanding the view on drivers and causes of OT, from looking at present stressors and recovery activities to looking at many past and present motivators, stressors, and influences. The model also presents the idea that, at any time, a different category of factors, intra-personal, interpersonal, situational, or cultural might be the major influence on OT processes. From considering the *capacity* aspect of Kenttä and Hassmén's description of stress/recovery balance, it could be inferred that this part is associated with past experiences and behaviours, but Kenttä and Hassmén did not emphasise athletes' pasts. Rather, using the methods of monitoring training exertion and recovery, they emphasised current stressors and current recovery, perhaps assuming that capacities are more or less stable. The capacity aspect does provide opportunities for discussing injuries, illnesses, and psychological stressors as antecedents of OT. Conceivably, the physiological capacity of an athlete is reduced during times of illness and injury, and the social and psychological capacity components also might allow for discussions about influences of

past experiences on choices of coping mechanisms. Nonetheless, Kenttä and Hassmén did not go into great detail on these issues.

Within the processes, and particularly in the outcomes sections of the *OT Risks and Outcomes Model*, I have also included injuries and illnesses as part of the aetiology of stress/recovery imbalances, as potential markers of OT, and as significant outcomes of OT processes. I understand that previous models of OT have been directed at conceptualising and identifying processes that lead exclusively to OT syndrome, or what has also been called unexplained underperformance syndrome (Budgett, 1998), underrecovery (Kellmann, 2002; Kenttä & Hassmén, 2002), and the staleness syndrome (Kenttä & Hassmén, 2002), and the authors of such models might have purposely left out discussions of injury and illness because they were only interested in the outcome of OT syndrome. Nonetheless, given the frequency of injuries and illnesses in competitive sport and their relations to the same processes that lead to OT syndrome, as illustrated in Studies 1 and 2, it seems important to include them in any discussion of OT.

In addition to illnesses and injuries, I have included psychosocial issues in the processes and outcomes parts of the model, as markers and consequences, and have tried to depict psychosocial issues as mediating or causal variables in the behavioural responses part of the model. Although Kenttä and Hassmén (1998, 2002), Meyers and Whelan (1998), and many other researchers (e.g. Berglund, & Säfström, 1994; Fry et al., 1994; Hooper et al., 1997; Hooper et al., 1995; Morgan, Costill, et al., 1988) have highlighted psychosocial issues as playing important roles in OT, much of the discussion of psychosocial factors in OT has revolved around psychological distress, usually measured by a mood inventory, such as the POMS, being a marker of impending OT syndrome. Kenttä and Hassmén enhanced this discussion by pointing out the contributory function of psychosocial stressors in upsetting stress/recovery balances and leading to OT syndrome,

and Hooper and Mackinnon (1995), O'Toole (1998), and Steinacker and Lehmann (2002) provided OT definitions that included depression and general disruptions of psychological well-being in their descriptions of possible adverse outcomes associated with OT.

Nevertheless, there does not appear to be an OT model or framework that shows the psychosocial issues, concurrently, as causes, markers, and consequences of OT. I hope that by including the multiple functions and positions of psychosocial issues in my model, I might improve understanding for *why* and *how* athletes begin and continue to overtrain.

The responses part of the *OT Risks and Outcomes Model* may be seen as augmenting Kenttå and Hassmén's work on the underlying factors of OT processes, because it highlights the mediating influence of psychosocial components from Part 1 on behavioural responses to stress/recovery imbalances, and prompts exploration into *why* and *how* athletes might respond, in the ways they do, when they experience such imbalances. Answering these *why* and *how* questions could be an integral part of interventions targeted at minimising OT processes and outcomes. Looking at *how* the multiple systems and contexts in athletes' lives interact and operate, and *why* athletes might continue to overtrain despite knowledge and advice to the contrary, could help people observing and working with the athletes, including coaches, parents, sports administrators, and sports scientists, to take the most effective actions in guiding the athletes to more balanced lives. For example, when athletes begin to experience stress/recovery imbalances, it is not the imbalances that prompt them to push harder or neglect recovery, it is more likely the anxiety they feel about not being able to live up to expectations and please their parents and coaches that prompts continued OT behaviours.

In some ways, I think of my research, and the emerging *OT Risks and Outcomes Model*, as synthesising many different issues in OT and as representing a series of case studies that illustrate combinations of the Meyers and Whelan and the Kenttå and Hassmén

models. The experts in Study 1 presented quite a comprehensive list of many of the different systems or contexts that influenced OT behaviours, within which athletes operate. The athletes' stories in Study 2 showed the idiosyncratic flavour of individuals overtraining within those systems and contexts.

My research could augment Kenttä and Hassmén's model with respect to monitoring for OT syndrome and other OT outcomes. I hope that the current model might stimulate the monitoring of OT-related injuries, illnesses, and other negative psychological outcomes (e.g., if an athlete starts experiencing muscle tightness, is assessed to have a stress/recovery imbalance, and might be displaying some anxiety about the situation, then coaches and others might be alerted to intervene with increased recovery and prophylactic treatment). The model might also help in understanding and anticipating OT situations by providing scope for examining the influences of cultural precipitators, past and present intra- and interpersonal factors, and sport and non-sport situational variables. Perhaps the model might help in assessing individual behaviour patterns and vulnerability to OT, in anticipating athletes' responses to OT situations, and in understanding athletes' responses to injury and rehabilitation.

In summary, the results of Studies 1 and 2 and the *OT Risks and Outcomes Model* provide extra detail to enhance understanding of interactions within the multiple sport and non-sport systems that Meyers and Whelan outlined, and within the physiological, psychological, and social components of OT that Kenttä and Hassmén described. This thesis, and the emergent model, present myriad variables that can influence and upset athletes' stress/recovery balances, as well as descriptions of *how* these variables act upon athletes' lives (e.g., by motivating extra training, by affecting recovery needs). This thesis and the *OT Risks and Outcomes Model* also supply information on *why* athletes might be driven to upset their stress/recovery balances, as well as providing a background context to

the athletes' beliefs and behaviours. Furthermore, the research and the model provide emphases on dynamic factors in athletes' interactions with people surrounding them, and present examples of when athletes will continue to overtrain against better knowledge and guidance, along with cases where athletes overtrain for different reasons. The athlete stories provide a rationale for emphasising injury as one of the most significant outcomes of OT, and for looking at OT sequelae in assessing injury. Finally, some of the experts' comments about markers might add to the literature on monitoring and identifying OT, and their comments about preventive measures could be integrated into practical interventions aimed at treating or minimising OT.

Methodological Issues, Future Research, Implications for Professional Practice,
Implications for Me, and Contributions to the Literature

Methodological Issues

With respect to methodological issues in this thesis, I designed a research project that helped me achieve my goals of broadening my perspectives on, and knowledge about, OT risk factors. Nonetheless, the thesis had a few limitations that could be addressed with future research. On the positive side, conducting in-depth interviews with experts and athletes about OT experiences gave me insight into the complex interactions among influences that drive athletes to OT. With a qualitative approach, I had freedom to explore in depth, with experts and athletes, a large range of issues surrounding OT, and I offered athletes opportunities to talk about some of the deeper meanings of OT for them, including why and how they struggled with OT throughout their careers. In particular, during the unstructured interviews I could delve into some of the psychodynamic influences, abusive and coercive drivers, and pathogenic behaviours revolving around OT processes, responses, and outcomes for the athletes, aspects that had not been addressed in previous literature. In talking to experts from a number of different fields (coaching, sport

physiology, sport psychology, and sport medicine), I felt confident that my data represented a diverse array of perspectives on OT risk factors. In talking to athletes from different sports, and with different types of OT experiences, I developed the sense that the experiences of OT phenomena might be universal across all sports.

In terms of limitations, I conducted research that was exploratory and involved athletes from elite levels of competitive sport, but was not designed to draw conclusive inferences about OT risk for all populations of athletes. At this stage, the *OT Risks and Outcomes Model* is descriptive and explanatory and remains to be tested in applied settings to determine its utility. Furthermore, I conducted interviews that were one-off interactions with experts and athletes, during which I relied on retrospective accounts of OT experiences. If I had had more time and resources, I might have tapped into additional OT risk factors by following experts and athletes, longitudinally, throughout one or more competitive seasons. Refining the risk factor list and the model might be topics of future research, which are discussed in the next section.

Future Research

With the outcomes of this thesis, I hope to stimulate a number of different future research directions. With the emphasis on injury, illness, and psychological distress as significant outcomes of OT processes, I think that research could be directed at more holistic evaluations of OT-related injuries, illnesses, and mental health concerns. In particular, researchers could conduct longitudinal studies directed at examining injuries, illness, and psychosocial sequelae within the context of OT. With such studies, researchers could illuminate more OT-related causes of injury, illness, and mental health problems, and perhaps provide insight into the types and frequencies of these issues associated with OT. Researchers involved in such studies could take both case study and survey approaches to gathering information about injury, illnesses, and psychosocial problems in

OT contexts. Case studies could provide additional perspectives on the idiosyncratic aspects of injury, illness, and psychosocial issues for different athletes, whereas, survey research could provide data about types and frequencies of injury, illness, and psychosocial problems. With any research, I would hope that investigators include measures of performance, the most important measure to coaches and athletes, to compare with the other outcomes of their studies.

In addition to exploring the multiple outcomes of OT, future researchers could continue the exploration into OT risk factors that I initiated in this thesis. Similar to injury and illness studies, researchers could conduct both case study and survey research on OT risk factors to augment the current investigations. Researchers could carry out case studies in which they monitor OT risk in athletes over one or more seasons, and could develop and administer risk assessment surveys, derived from the risk factor list and the *OT Risks and Outcomes Model*. Researchers conducting case study and survey research could explore such issues as athletes', parents', and coaches' attitudes toward, and behaviours associated with, performance, success, failure, training, recovery, injury, illness, psychological distress, and other OT processes and outcomes outlined in the model. Furthermore, researchers could develop an applied checklist of OT risk factors, which could provide quantitative measures of risk to be compared to other statistics gathered from performance measures, quantifiable physiological and psychological markers of OT (if any reliable markers are established), and injury and illness statistics. In conducting idiographic research and large-scale survey studies, researchers could provide greater understanding of both the specific experiences of, and general trends in, OT risk, and of the attitudes and beliefs regarding OT that people hold across multiple sports and cultures.

Looking at detailed descriptions of OT from the current model, future researchers could also conduct more precise prevalence investigations than has been done in the past

(e.g., Morgan et al., 1988; Morgan, O'Connor, Sparling et al., 1987), research that was based on vague definitions of OT. In conducting OT prevalence studies, researchers could gather more specific and meaningful data about the occurrence of OT processes and outcomes than found in past research. Researchers could also develop and administer questionnaires, based on the model, which present a series of specific questions for athletes regarding the frequency of OT processes and outcomes.

Although prevention and treatment were not focal points of this thesis, researchers could use the results of Studies 1 and 2 to provide a framework for exploring OT interventions. The experts in Study 1 talked about OT education and awareness being important factors in prevention, as well as pointing out the significance of improving coach-athlete-parent communication patterns. The stories of athletes in Study 2 illustrated how lack of education and awareness about OT issues, and poor communication and maladaptive reinforcement patterns greatly influenced athletes' OT behaviours. Researchers could conduct studies that test the effects of communication skills and educational interventions centred on OT risk factors, for coaches, parents, and athletes. Researcher could also conduct studies in which they apply the risk factor list and the *OT Risks and Outcomes Model* to identifying OT risk in athletes, and then use preventive techniques and interventions aimed at minimising risk and optimising stress/recovery balances. Researchers could apply these intervention studies on a longitudinal basis, during which comparison groups could be given staggered intervention protocols.

Implications for Professional Practice

Applied practitioners in a number of different sport and health professions, such as doctors, physiotherapists, psychologists, physiologists, trainers, and coaches, could apply the risk factor list, and the *OT Risks and Outcomes Model*, to the following areas: (a) education of athletes, coaches, parents, health professionals, and sports administrators

about OT risks and outcomes, especially about the not-so-obvious risk factors and outcomes depicted in the model; (b) development and implementation of OT assessment and monitoring for the purposes of minimising OT and its outcomes; and (c) exploration and identification of athletes' OT experiences within psychological or medical health consultations to enhance therapies and interventions.

First, practitioners could incorporate the results of this thesis into education seminars for athletes, coaches, parents, health professionals, and sports administrators. To help drive behaviour changes that reduce the prevalence of OT, people might have to become aware of the myriad variables, intra-personal, interpersonal, situational, and socio-cultural that contribute to OT processes and outcomes. Athletes could benefit from increased education in that they might improve self-monitoring behaviours for OT risk, whereas coaches and parents could benefit from increased education about OT risk factors in that they might learn more constructive reinforcement patterns, and be better positioned to offer balanced guidance. Health professionals, with improved OT awareness and education, might be better equipped to provide accurate medical and psychological diagnoses, conduct thorough clinical assessments, and plan effective rehabilitation and recovery activities. Sports administrators, with improved OT awareness and education, might be more likely to initiate beneficial systemic, political, and cultural changes with regard to OT and its outcomes.

Second, experts, coaches, athletes, parents, and others could use the results of this thesis to help in the identification of OT risk during its early stages, such that they can take steps to minimise it. People working with athletes could apply the following suggestions about prevention from the experts in Study 1:

1. Engaging in Preventive Actions and Behaviours

- Take initiative to reduce training, if necessary

- Monitor athletes' feelings regarding performance
- Monitor and assess athletes' beliefs about training and recovery
- Monitor physical and psychological signals regarding fatigue and recovery
- Design training programs according to individual athlete needs
- Monitor stressors in athletes' lives, both inside and outside sport
- Try not to sustain, unrealistically, an athlete's peak in performance

2. Improving Education and Awareness

- Help athletes to develop awareness for different levels of fatigue
- Develop awareness of one's limitations as a coach
- Educate parents, coaches, and athletes regarding abuse and personal boundary issues
- Educate athletes, coaches, parents, and others regarding recovery, and other issues related to a balanced approach to life
- Educate athletes about individual differences in training and recovery capacities
- Emphasise athlete life balance

3. Enhancing Communication

- Communicate about the importance of rest and recovery
- Emphasise open communication to and from athletes, especially regarding injury, fatigue, illness, psychological distress and other life stressors

Finally, psychologists, or others working with athletes in therapeutic settings, could use the results of this thesis as a framework to explore and identify the meanings of OT experiences for athletes, such that they could help the athletes to achieve general life balance in both sport and non-sport contexts. Practitioners, such as doctors and psychologists, might refer to the risk factor list and the *OT Risks and Outcomes Model* to explore causes of maladaptive behaviours and poor performances, which could help them

to guide change around such behaviours. Furthermore, practitioners could use the results of this thesis to help in the assessment of, responses to, and rehabilitation from injury, and in making more precise attributions about the causes of injury, and more effective plans for future injury prevention.

Implications for Me as Researcher, Practitioner, and Athlete

I had read the Kenttä and Hassmén (1998, 2002) work and conducted all of my interviews before my last attempt to make the Canadian Olympic team in rowing for the 2004 Games. After my first disappointment with OT-induced injury in the lead up to Sydney 2000, I felt that I was better equipped than previously with knowledge and experience about OT, and thought I would find a way to manage my body more effectively than I had in 1998/99. Nonetheless, once I joined the National Team training group in 2003, I experienced many explicit and implicit pressures to train harder, and to block out niggles and slight illnesses, and to return to training prematurely following illness. I was reminded that despite all of my research efforts, increased knowledge, and psychological skills, there are often forces seemingly more powerful than my own will and sense of control. My experiences in sport, my research on OT, and my narcissistic tendency to believe that I can make a difference to masses of athletes, have made me realise that, as a researcher and a practitioner in sport psychology, I can get caught up thinking that I might effect massive changes regarding OT in competitive sport, when, in reality, I might be lucky enough to help a few individual athletes find more balance within their lives, and more acceptance of their human frailty. Nonetheless, I have come to realise that, with my research as a guide, if I can help one person to control the damage done to them by OT, I could be happy that I have contributed something significant to the world. For me, personally, I am still trying to apply the findings of my research to my personal life, and little by little, finding ways to seek balance and accept my own humanness.

Contributions of the Thesis

At the outset of this thesis there was equivocal research on risk factors associated with OT. To my knowledge, the data in the literature related to OT risk factors had been part of studies that were not directed at gathering information specifically about OT risk, and the data appeared to have emerged from researchers' anecdotal observations in the course of non-risk factor research or while writing general OT review articles and book chapters (e.g., Botterill & Wilson, 2002; Budgett, 1990; Fry, et al., 1991; Kellmann, 2002; Kenttä & Hassmén, 2002; Krane et al., 1997). To my knowledge, with the two studies in this thesis, I am the first to systematically gather information on OT risk factors. In this investigation of OT risk factors I have tried to look at *why* athletes overtrain, hoping that by finding answers to this question, I might stimulate coaches, athletes, doctors, sport psychologists, sport physiologists, sport administrators, and parents to find ways to prevent, or at least minimise, the damage of this global phenomenon in sport. With the results of Studies 1 and 2, and with the *OT Risks and Outcomes Model*, I hope that I have broadened perspectives on what overtraining is all about for athletes, and at the same time, have offered specific details and examples of individuals struggling with overtraining, which might augment the work already done by Kenttä and Hassmén (1998, 2002), Meyers and Whelan (1998), and others (e.g., Kellmann, 2002) on holistically conceptualising OT.

With respect to perspectives and details, on the one hand, I believe that the risk factor list, which I derived from the expert interviews, represents a comprehensive, although not exhaustive, outline of the many different variables to consider when conducting OT risk assessments of athletes. On the other hand, with the athletes' stories, I provided insight into some of the deeper psychodynamic factors driving athletes' behaviours, especially with respect to being abused or coerced by parents and coaches to train harder or to neglect well-being. Furthermore, with the athletes' stories, I was

reminded that athletes, like most people, have a mass of contradictory emotions and behaviours, which might best be understood through in-depth explorations of past emotional experiences, and of current emotional needs for love and approval.

When depicting the model, I found that the results of both Studies 1 and 2 highlighted the importance of considering multiple outcomes of OT processes, such as illness, injury, and psychosocial problems, beyond just OT syndrome (which has usually been the singular outcome of interest in most OT literature). Although researchers might choose to study only OT syndrome, it seems that they could still mention that illness, injury, and psychological distress are the other possible outcomes of the same processes that lead to OT syndrome. I feel like I have been harping on the significance of multiple outcomes of OT processes, especially injuries, but I have done so because I see it everywhere I look in competitive sport. Just this past weekend, while writing this final chapter, I read an article (Guilliatt, 2005) in the popular press about how Australian footballers, similar to the athlete depicted in the story of Steve, pay a hefty price of lifelong pain and debilitation for having pushed through acute injuries, and having consistently trained and played with chronic injuries throughout their careers. Commenting on the footballers, Guilliatt stated “Defying severe injuries to take the field will win them honour and acclaim but, come retirement in their 30s, they’re left with the broken, crippled bodies of old men” (p. 26). Although injury is not always avoidable in many competitive sports, I hope that this research might help many athletes to take more adaptive approaches to coping with and rehabilitating from injury.

Finally, I hope that this thesis might challenge researchers and practitioners to continue to think more holistically about OT, to conduct more rigorous OT research, in which more confounds are controlled and more outcomes are measured, to seek greater understanding of the myriad variables putting athletes at risk for OT, and to develop

practical applications of OT research knowledge for practitioners to use with athletes. I also hope that one day athletes might stop trying to damage their bodies in attempts to win love and approval from parents, coaches, and others, and might come to the conclusion that they are good enough, even without competitive sport.

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APPENDIX A

Semi-Structured Interview Guide for Expert Participants

Background Information: to get the interview started, I will ask participants about their involvement in sport and the roles they have played as a coaches, doctors, sport psychologists, or physiologists.

Main Interview Topics:

1. Open ended discussion/free recall of experience with athletes who overtrain

Recall of overtraining experience

Sample questions:

How would you describe your experience with athletes who overtrain or are injured as a result of overtraining?

How would you describe the major causes of overtraining?

Probing questions

Based on free recall, ask interviewee to expand on their discussion topics.

Follow-up questions

Based on responses to probing questions, ask for any further details on discussion topics.

2. Questions focussing on characteristics of the athlete

Open-ended discussion

Sample questions:

How would you describe the characteristics of an athlete who overtrains?

What sorts of things do you think predispose an athlete to overtraining?

From your experience, what do you think differentiates athletes who do and do not overtrain?

Probing & follow-up questions

3. Questions focussing on the experiences of the athlete

Open-ended discussion

Sample question:

What sorts of experiences in an athlete's career do you think influence overtraining behaviour?

Probing & follow-up questions

4. Questions focussing on external influences

Open-ended responses to questions

Sample questions:

What sorts of things, external to the characteristics of the athlete, influence overtraining?

What situations, outside the athlete's sport, might influence overtraining?

How would you describe physical environment issues, such as bad weather, poor training facilities/conditions, that might influence overtraining?

Probing & follow-up questions

APPENDIX B

Information for Expert Participants Involved in Research

Statement of project:

Currently, as researchers, we do not have a complete picture of the factors that predispose athletes to overtraining and injury related to overtraining. We need to understand what mechanisms underlie overtraining if we are going to manage it effectively. Much of the research literature has focussed on physiological markers of overtraining and has not attempted to examine psychosocial factors that drive athletes to overtraining behaviour in the first place. It is the goal of this research to increase the understanding of overtraining by talking to the athletes, coaches, sport scientists, and medical experts who deal with this issue. The research objective is to provide useful information for athletes, coaches, sports medicine experts and sport psychology practitioners that can help them monitor, prevent, and treat overtraining.

Procedures

As a participant in this study, you will be requested to take part in an interview, lasting from 30-60 minutes, which gives you the opportunity to recall your experiences with athletes who have overtrained or have been injured as a result of overtraining. The interview will focus on what you feel are the major causes of overtraining. You will be invited to discuss topics such as the characteristics of the overtrained athlete, the role of coaches, sports medicine personnel and family, and situational variables such as training schedules and commitments outside of sport. The interview will be audio taped.

Important Issues

Should you have any questions at any time prior to, during, or after participation in the research, contact details for the investigators are provided at the bottom of this page. Furthermore, contact details for the Victoria University Ethics Committee are also provided should there be a need to address any ethical concerns about the procedures or any other aspects of the research project.

Please be aware that the strictest confidentiality will be upheld; all information will only be used for the purpose of the investigation; it will be stored under lock and key, will only be accessed by the research investigators, and will be coded such that individuals cannot be identified – your name will not be associated with any information provided by you, and any personally identifying information, such as on the consent form, will be stored separately from the data.

Please also note that if anything is upsetting you to the point that you do not wish to continue at any time during the interview, you may end the interview and postpone it until a time convenient for you or you may withdraw completely without continuing the interview at a later time. Please be advised that participation is voluntary and that you may withdraw from the study at any time without jeopardising yourself in any way.

Any queries about your participation in this project may be directed to the researcher, Dr. Tony Morris, ph. 03-9688 5353. You may also contact associate researcher, Dr. Mark Andersen, ph. 03-9687 7086 or the student researcher, Mr. Sean Richardson, ph. 03-9688 4066. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MC, Melbourne, 8001 (telephone no: 03-9688 4710) or John Williams, Secretary, AIS Ethics Committee, Canberra (Ph: 02 6214 1816; Fax: 02 6214 1603 or email: williamsj@ausport.gov.au).

APPENDIX C

Consent Form for Expert Participants Involved in Research

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study investigating the causes of overtraining or injury that results from overtraining behaviour. Currently, as researchers, we do not have a complete picture of the factors that predispose athletes to overtraining and injury related to overtraining. We need to understand what mechanisms underlie overtraining if we are going to manage it effectively. Much of the research literature has focussed on physiological markers of overtraining and has not attempted to examine the psychosocial factors that drive athletes to overtraining behaviour in the first place. It is the goal of this research to increase the understanding of overtraining by talking to the athletes, coaches, sport scientists, and medical experts who deal with this issue. The research objective is to provide useful information for athletes, coaches, sports medicine experts and sport psychology practitioners that can help them monitor, prevent, and treat overtraining.

CERTIFICATION BY PARTICIPANT

I,
of

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study entitled Overtraining in Elite Athletes, being conducted at Victoria University of Technology by: Dr. Tony Morris, Dr. Mark Andersen & Mr. Sean Richardson

I certify that the objectives of the study, together with any risks to me associated with the procedures listed hereunder to be carried out in the study, have been fully explained to me by *Mr. Sean Richardson* and that I freely consent to participation involving these procedures.

Procedures

As a participant in this study, you will be required to take part in an interview, lasting from 30-60 minutes, which gives you the opportunity to recall your experiences with athletes who have overtrained or have been injured as a result of overtraining. The interview will focus on what you feel are the major causes of overtraining. You will be invited to discuss topics such as the characteristics of the overtrained athlete, the role of coaches, sports medicine personnel and family, and situational variables such as training schedules and commitments outside of sport. The interview will be audio taped. Please be aware that the strictest confidentiality will be upheld in dealing with all information and research data.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way. I have been informed that the information I provide will be kept confidential.

Signed:

Witness other than the researcher:

Date:

Any queries about your participation in this project may be directed to the researcher (Name: Dr. Tony Morris ph. 03-9688 5353). If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MC, Melbourne, 8001 (telephone no: 03-9688 4710) or John Williams, Secretary, AIS Ethics Committee, Canberra (Ph: 02 6214 1816; Fax: 02 6214 1603 or email: williamsj@ausport.gov.au)

APPENDIX D

Information for Athlete Participants Involved in Research

Statement of project:

Currently, as researchers, we do not have a complete picture of the factors that predispose athletes to overtraining and injury related to overtraining. We need to understand what mechanisms underlie overtraining if we are going to manage it effectively. Much of the research literature has focussed on physiological markers of overtraining and has not attempted to examine what drives athletes to overtraining behaviour in the first place. It is the goal of this research to increase the understanding of overtraining by talking to the athletes, coaches, sport scientists, and medical experts who deal with this issue. The research objective is to provide useful information for athletes, coaches, sports medicine experts and sport psychology practitioners that can help them monitor, prevent, and treat overtraining.

Procedures

As a participant in this study, you will be requested to take part in an interview, lasting from 1-1.5 hours, which gives you the opportunity to recall your experience with overtraining and/or injury related to overtraining. The interview will focus on what you feel are the major causes of your own overtraining. You will be invited to discuss cover topics such as your history of competitive sport, your history of injury and overtraining, the role of your coaches, sports medicine practitioners and family, and situational variables surrounding your life, such as training schedules and commitments outside of sport. The interview will be audio taped.

Important Issues

Should you have any questions at any time prior to, during, or after participation in the research, contact details for the investigators are provided at the bottom of this page. Furthermore, contact details for the Victoria University Ethics Committee are also provided should there be a need to address any ethical concerns about the procedures or any other aspects of the research project.

Please be aware that the strictest confidentiality will be upheld; all information will only be used for the purpose of the investigation; it will be stored under lock and key, will only be accessed by the research investigators, and will be coded such that individuals cannot be identified – your name will not be associated with any information provided by you, and any personally identifying information, such as on the consent form, will be stored separately from the data.

Please also note that if anything is upsetting you to the point that you do not wish to continue at any time during the interview, you may end the interview and postpone it until a time convenient for you or you may withdraw completely without continuing the interview at a later time. Please be advised that participation is voluntary and that you may withdraw from the study at any time without jeopardising you in any way.

Any queries about your participation in this project may be directed to the researcher, Dr. Tony Morris, ph. 03-9688 5353. You may also contact associate researcher, Dr. Mark Andersen, ph. 03-9687 7086 or the student researcher, Mr. Sean Richardson, ph. 03-9688 4066. If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MC, Melbourne, 8001 (telephone no: 03-9688 4710) or John Williams, Secretary, AIS Ethics Committee, Canberra (Ph: 02 6214 1816; Fax: 02 6214 1603 or email: williamsj@ausport.gov.au).

APPENDIX E

Consent Form for Athlete Participants Involved in Research

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study investigating the causes of overtraining or injury that results from overtraining behaviour. Currently, as researchers, we do not have a complete picture of the factors that predispose athletes to overtraining and injury related to overtraining. We need to understand what mechanisms underlie overtraining if we are going to manage it effectively. Much of the research literature has focussed on physiological markers of overtraining and has not attempted to examine what drives athletes to overtraining behaviour in the first place. It is the goal of this research to increase the understanding of overtraining by talking to the athletes, coaches, sport scientists, and medical experts who deal with this issue. The research objective is to provide useful information for athletes, coaches, sports medicine experts and sport psychology practitioners that can help them monitor, prevent, and treat overtraining.

CERTIFICATION BY PARTICIPANT

I,
of

certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study entitled Overtraining in Elite Athletes, being conducted at Victoria University of Technology by: Dr. Tony Morris, Dr. Mark Andersen & Mr. Sean Richardson

I certify that the objectives of the study, together with any risks to me associated with the procedures listed hereunder to be carried out in the study, have been fully explained to me by *Mr. Sean Richardson* and that I freely consent to participation involving these procedures.

Procedures

As a participant in this study, you will be required to take part in an interview, lasting from 1-1.5 hours, which gives you the opportunity to recall your experience with overtraining. The interview will focus on what you feel are the major causes of your own overtraining. You will be invited to discuss topics such as your history of competitive sport, your history of injury and overtraining, the role of your coaches, sports medicine practitioners and family, and situational variables surrounding your life, such as training schedules and commitments outside of sport. The interview will be audio taped. Please be aware that the strictest confidentiality will be upheld in dealing with all information and research data.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way. I have been informed that the information I provide will be kept confidential.

Signed:

Witness other than the researcher:

Date:

Any queries about your participation in this project may be directed to the researcher (Name: Dr. Tony Morris ph. 03-9688 5353). If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MC, Melbourne, 8001 (telephone no: 03-9688 4710) or John Williams, Secretary, AIS Ethics Committee, Canberra (Ph: 02 6214 1816; Fax: 02 6214 1603 or email: williamsj@ausport.gov.au).

OT Risks and Outcomes Model

