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Running Head: Return to Sport Following Serious Injury

The Psychosocial Aspects of a Return to Sport Following Serious Injury: A Review of the
Literature from a Self-Determination Perspective'

Key words: injury, return-to-sport, elite athlete, self-determination theory

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The Psychosocial Aspects of a Return to Sport Following Serious Injury: A Review of the Literature From a Self-Determination Perspective

Over the past three decades, a greater awareness of the psychosocial factors involved in sport injury occurrence and rehabilitation have led to extensive research efforts on these subjects. More recently, there has been a growing interest in the psychological aspects of the return to sport following serious injury (Andersen, 2001; Bianco, 2001, Evans, Hardy & Flemming, 2000; Gould, Udry, Bridges, & Beck, 1997a; Taylor & Taylor, 1997). Two important developments have promoted this interest. First, it has increasingly been recognized that physical and psychological readiness to return to sport after injury do not always coincide (Crossman, 1997; Ford & Gordon, 1998). Second, there has been an increase in the incidence of serious injury, at the elite level (e.g., Orchard & Seward, 2002; Renstrom, 1991). Therefore, the number of returning athletes who are physically but not necessarily psychologically prepared to re-enter training and competition may also be on the rise.

This paper utilizes self-determination theory (SDT) (Ryan & Deci, 2000) to examine and critique research investigations and reports on the psychosocial sport injury literature dealing with the post-injury recovery time period when the athlete is returning to training and competition. The review is based on a database search of peer-reviewed articles from Medline, Sport Discus and Psycinfo between 1970 and 2006 using a variety of search terms and combinations of terms (e.g., “return to sport”, “psychology of athletic injury”, “sport injury”). Of the 192 sport injury articles retrieved 80 were deemed relevant to the present review and are discussed below. The review is divided into four sections. In section one, a discussion of conceptual models that have been used to describe the return to sport transition are presented. Given the limitations of the two models, self-determination theory is presented as a coherent theoretical framework in which to explore and understand issues related to the return-to-sport following injury (section two). In section three, the psychosocial literature on

the return to sport from injury is examined within a self-determination framework. Analysis of this literature reveals the ways in which needs of competence, autonomy and relatedness may be prominent among athletes returning to sport following injury. In the fourth and final section, the implications of the research findings are presented and suggestions for future research are provided in line with self-determination theoretical contentions.

Conceptual Models and the Return to Sport Following Injury

Numerous conceptual models have been proposed in the sport injury context in an effort to examine the factors influencing injury occurrence, the response to injury and the return to sport from injury. Much of the empirical research on the psychology of sport injury has tested Andersen and Williams (1988) stress and injury antecedent model, stage-based grief response models (e.g., Kubler- Ross, 1969) and Wiese-Bjornstal, Smith, Shaffer and Morrey's (1998) integrated response to injury model (see Brewer, 2001a for a review). Much less attention, however, has been given to conceptual models dealing with the return-to-sport following injury recovery. Taylor and Taylor's (1997) return to sport model, for example, has undergone little, if any, empirical evaluation. Despite Andersen's (2001) suggestion that the biopsychosocial model may be particularly useful in examining return-to-sport issues, few empirical tests of the model have ensued for this important transition either. An important starting point in determining the utility of these models for gaining a more comprehensive understanding of the key variables influencing the return to sport transition is to examine their strengths and limitations.

Stages of the Return to Sport Model

Taylor and Taylor's (1997) stage model of the return to sport is composed of five physical and psychological stages including: the "initial return," "recovery confirmation," "return of physical and technical abilities," "high intensity training," and "return to competition." They contend that athletes' ability to pass successfully from one stage to the

next in their return to sport may be strongly contingent upon the injury healing, physical conditioning, and the psychological rehabilitation that has preceded the return to sport phase of recovery. The model is presented in Figure 1.

The first stage, *the initial return*, provides athletes with their first opportunity to test the rehabilitated area. This stage is dedicated to giving athletes a number of tests of the healed area that will lead to the second stage of the return to sport, *recovery confirmation* (Taylor & Taylor, 1997). To ensure that athletes successfully move from stage one to stage two, Taylor and Taylor (1997) contend that unrealistic expectations about the ability of the rehabilitated area to withstand increased exertion and a desire to return too quickly must be addressed.

During the second stage, athletes obtain feedback from the *initial return* that their injury is, in fact, healed and that they are ready to face the demands of training and competition. According to Taylor and Taylor (1997), the primary goal of this stage is for athletes to develop a strong belief that the rehabilitation was successful and that they are completely ready to move on to the third stage, the *return of physical and technical abilities*. In the third stage the primary focus is on restoring athletes' levels of physical conditioning and technical proficiency in preparation for the later stages.

The fourth stage—*high-intensity training*—marks the conclusion of athletes' identification as injured or rehabilitating (Taylor & Taylor, 1997). During this stage, athletes' physical conditioning and technical base is built upon in order to prime them for a return to a high level of competitive performance equal to or surpassing their pre-injury level. According to Taylor and Taylor (1997), athletes in the fourth stage should feel little anxiety about the health of the rehabilitated area or their ability to perform at the desired level as they enter the final phase and ultimate goal of rehabilitation, the *return to competition*.

Returning to competition may undoubtedly be a source of excitement but it may also evoke feelings of trepidation and anxiety regarding the uncertainties of the “success” of the rehabilitation efforts and the ability to perform at pre-injury levels (Taylor & Taylor, 1997). Athletes may also have fears about putting themselves in the same situation in which the initial injury occurred. A discussion with athletes at this time may be beneficial in allowing them to express any concerns or fears and to redirect their focus onto the positive aspects of the competition (Taylor & Taylor, 1997).

The return to sport model proposed by Taylor and Taylor (1997) is helpful in so far as it reminds practitioners, clinicians and coaches, that it may take athletes some time before they are able to compete to their full capabilities. According to Taylor and Taylor (1997), knowing the various stages of a return to sport will help make the sometimes lengthy return to full functioning seem more manageable for athletes. It will also give athletes’ a greater sense of predictability and control over their transition from rehabilitation to training and competition.

A number of criticisms can be leveled against Taylor and Taylor’s (1997) model. First, it is unclear, where the first stage, the “initial return” begins and ends, or what the stage actually consists of. Taylor and Taylor do not specify what type of tests they are referring to in suggesting that the *initial return* provides athletes with a “series of tests” that the injured area is healed. Second, as with other stage models, Taylor and Taylor’s (1997) model fails to account for individual differences with regard to athletes’ ability to move from one stage to the next (Eklund & Bianco, 2004). That is, the model gives no indication why athletes progress through the stages at varying speeds and with varying degrees of success. Third, the assumption that all formerly injured athletes pass through a common sequence of discrete physical and psychological stages in the process of returning to competition has not been empirically documented (Brewer, 2001b). Moreover, the authors could find no empirical

evidence to support the contention that the return to sport transition is best conceptualized in terms of the 5-stage approach outlined by Taylor and Taylor (1997). Although the model is prescriptive in terms of the level of physical and psychological functioning that athletes *should* be at in particular points of their return to sport, it remains unclear if in fact they are. That is, the model seems to present the ideal return to sport versus the reality of what athletes may or may not experience. Fourth, the model assumes that athletes move in a linear fashion from the “initial return” to a “return to competition”. It may be, however, that an athlete does not receive recovery confirmation (i.e. complete stage two) before progressing to stage three. That is, some athletes may not feel completely healed but, nonetheless, decide to progress to stage three. Alternatively, some athletes may feel they have received recovery confirmation (i.e. completed stage two) and move to stage three only to discover that they are not ready to commence the process of recovering former fitness and skills. Unfortunately, no such feedback contingencies are considered in the model (Bogart & Delahanty, 2004). Given such limitations, it is worth examining other models that have been considered in relation to the return to sport transition following injury. We now turn our attention to Andersen’s (2001) discussion of the biopsychosocial model for understanding influential return to sport variables.

A Biopsychosocial Model

Andersen (2001) was among the first sport psychology researchers to apply the biopsychosocial model to an examination of the issues facing athletes making a return to sport following injury. In his applied suggestions and considerations, Andersen (2001) argued that returning a recovering athlete to full activity is a complicated and multifaceted process. This process is influenced by a plethora of factors, including the characteristics of the injury along with biological, psychological, and social variables. As depicted in Figure 2, Brewer, Andersen and Van Raalte’s (2002) biopsychosocial model has seven key components. These

include: the characteristics of the injury, sociodemographic factors, biological, psychological and social/ contextual factors. Also included in the model are intermediate biopsychological outcomes and sport injury rehabilitation outcomes.

Brewer et al. (2002) proposed that the characteristics of the injury as well as sociodemographic factors influence biological, psychological and social/contextual factors. Psychological factors are posited to have a reciprocal relationship with biological and social/contextual factors, all of which influence intermediate biopsychological rehabilitation outcomes (e.g., range of motion, strength, rate of recovery). Psychological factors and intermediate rehabilitation outcomes are also suggested to influence sport injury rehabilitation outcomes (e.g., functional performance, quality of life, readiness to return to sport).

Andersen (2001) suggests that examining the various parts of the model may give clues as to how athletes will respond to a return to sport following injury. Exploring the characteristics of the injury (e.g., severity, location or history) may provide useful information about the ways in which athletes may respond to the prospect of returning to sport. An anterior cruciate ligament (ACL) rupture in a soccer player may induce greater fears about regaining preinjury form and re-injury than an injury to that athlete's forearm. Given the importance of the injured limb to the sport performance, it seems more likely that the athlete will have concerns about re-injury and regaining pre-injury form. The athlete with the ACL injury may also experience psychosocial disruptions due to the severity of the injury, the associated period of rehabilitation and the perceived chances of full recovery (Andersen, 2001). Finally, if the athlete has not had any previous injury experience he or she may have a more difficult time adapting to the demands of the return to sport since she has never had the experience of successfully returning (Andersen, 2001).

Other factors such as sociodemographic, biological, psychological and social/contextual variables may play an equally important role in an athlete's course of recovery and ability to return to full activity (Andersen, 2001). If for instance, the athlete has received effective social support from the coach and teammates, has stayed involved with the team and has not been pressured to come back too early (i.e., social/contextual factors), then the athlete may feel more confident and supported in returning to play. Conversely, if the athlete has been isolated from the team and fears his/her position will be taken by another, the athlete may feel pressured and anxious about returning to play (Andersen, 2001). These and many other factors listed in the model may directly and indirectly influence sport injury rehabilitation outcomes and ultimately return to sport outcomes.

The biopsychosocial model provides a general framework for investigating the many factors affecting sport injury rehabilitation outcomes. Specifically, the model includes an extensive list of variables, and identifies general relationships among variable categories that may influence injury rehabilitation outcomes. Even while identifying relevant variables and general relationships, however, it is not a theory, and as a consequence does not (and cannot) provide a fully coherent explanation of how variables within and across categories might interact to produce different return-to-sport outcomes. Moreover, no indication is provided in the model of which factors may be most salient with the regard to the quality and experience an athlete has in returning to sport following injury, or why such factors are significant. Finally, the biopsychosocial model was not specifically designed to examine the transition from rehabilitation to training and competition. Andersen (2001) has utilized the model to advance suggestions and make considerations when helping athletes back into participation. The model however, is intended to deal with the time period covering injury onset to completion of rehabilitation and not the post-rehabilitation timeframe when the athlete is returning training and competition.

Given the shortcomings of Taylor and Taylor's (1997) stages of return to sport model and the biopsychosocial model, a more integrated theoretical approach is needed for synthesising and criticising past research and for guiding systematic future research efforts. No attempt however, has been made to organize or interpret the wide array of relevant findings using a theoretical framework providing an internally consistent, coherent explanation that afford predictions and testable hypotheses for the return-to-sport process. One theoretical approach that has been proposed as a framework for exploring and understanding issues related to the return to sport transition following injury is self-determination theory (Podlog & Eklund, 2004).

Toward a Self-Determination Perspective on the Return to Sport Following Injury

Examination of the psychosocial literature on the return to sport following injury indicates that returning athletes may commonly experience concerns and/or difficulties in three psychological areas: competency, autonomy and relatedness. Given the focus on these three areas in SDT it may be a particularly useful framework for interpreting and understanding athlete experiences in returning to sport after injury.

The contention offered here is *not* that SDT is the only framework in which to examine or interpret the themes emerging from the literature. There are other possibilities. Several theories from the health behavior literature including the social cognitive theory (Bandura, 1998), the Theory of Planned Behavior (Ajzen, 1991) or the Transtheoretical Model (Prochaska & Velicer, 1997) may hold potential relevance for understanding this return to sport transition. An examination of each of these theories is beyond the scope of this literature review. However, issues of self-efficacy, outcome expectations and motivation highlighted in the social cognitive theory (Bandura, 1998) are also evident in the psychosocial sport injury literature. From a social cognitive theory perspective, self-efficacy beliefs along with cognitive goals, outcome expectations, and perceived environmental

impediments and/or facilitators regulate human motivation, action and well-being (Bandura, 1998). Extant research on the return to sport from injury clearly indicates that efficacy beliefs (e.g., beliefs about remaining uninjured), goals and expectations (e.g., unrealistic performance expectations) and environmental factors (e.g., social support) may have important implications for athletes' psychological well-being, motivation and return to sport outcomes. While the social cognitive theory (or other health related theories) may help to explain various aspects of the return to sport transition, SDT seems to provide a comprehensive perspective on the salient issues facing athletes returning to sport from injury.

Self-Determination Theory and Research

Self-determination theory (Ryan & Deci, 2000) focuses on the social-contextual factors that facilitate versus undermine health, psychological well-being and intrinsic (self) motivation. Ryan and Deci (2000) propose that many of the actions and behaviors people perform are not energized purely by intrinsic motivations (Ryan & Deci, 2000). Rather, motivational states exist along a self-determination continuum with amotivation (i.e., the state of lacking the intention to act) representing the least self-determined form of motivation and intrinsic motivation (i.e., an action performed for the sheer enjoyment and interest of the activity itself) reflecting the highest level of self-determination. Extrinsically motivated behaviors, cover the continuum between amotivation and intrinsic motivation, varying in the extent to which their regulation is self-determined. These include external regulation, introjected regulation, identified regulation and integrated regulation. Externally regulated motivation (i.e., the least self-determined form of extrinsic motivation) results in behaviours performed to obtain rewards (e.g., praise, monetary compensation) or to avoid negative consequences (e.g., criticism from others). The athlete who returns to sport because the coach threatens to replace her if she does not is externally regulated. A somewhat more self-determined type of extrinsic motivation, introjected regulation, involves behaviors that are

performed to avoid guilt or anxiety or to attain ego enhancements such as pride (Ryan & Deci, 2000). The athlete who returns primarily to avoid the guilt of letting down her teammates by not returning is regulated by introjected motivations. Identified regulation is an even more self-determined type of extrinsic motivation exhibited when an individual engages in a behaviour out of personal valuation and endorsement of the behaviour. Although the behavior is performed by choice, it is still considered extrinsically motivated because it is performed for an outcome separable from the inherent experiential satisfactions associated with the behaviour itself. The athlete who returns because she desperately wants to meet a selection criterion or to win a big competition is regulated by identified motivations. Finally, the most self-determined form of extrinsic motivation is integrated regulation. Integration occurs when identified regulations are evaluated and assimilated into the self in line with one's other values and needs. Once again, actions characterized by this type of motivation are still considered extrinsic because they are performed to attain an outcome separate from the inherent enjoyment of the activity itself. The athlete who returns because she loves to demonstrate her athletic capabilities is regulated by integrated motivations.

Empirical research supports Ryan and Deci's (2000) contention that an individual's motivational state (i.e., where the individual is situated on the motivational continuum) is a reflection of the degree to which their three innate psychological needs for competence, autonomy, and relatedness are satisfied versus thwarted. Competence is characterized by a sense of proficiency or effectiveness in the things one engages in (Kilpatrick, Hebert, & Jacobsen, 2002). Autonomy is characterized by an internal locus of control and the perception that behaviors are self-authored or personally endorsed. The construct of relatedness refers to a sense of connectedness or belonging in the social world. Research across numerous social settings including education (e.g., Miserando, 1996), family (e.g., Grolnick, Deci, & Ryan, 1997) and sport (e.g., Frederick & Ryan, 1993) supports the

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contention that environmental supports for competence, autonomy and relatedness yields enhanced psychological functioning, self-regulation and intrinsic motivation. For example, Grolnick et al. (1997) found that autonomy-supportive parents, relative to controlling parents had more intrinsically motivated children. Moreover, different types of motivation have been associated with increasingly positive consequences as one moves toward the intrinsic end of the continuum (e.g., Frederick & Ryan, 1993; Kasser & Ryan, 1996). Numerous studies in the sport domain indicate that more autonomous forms of motivation (i.e., intrinsic motivation and identification) are associated with positive consequences including improved mental health (Frederick & Ryan, 1993), positive emotions (Vallerand & Losier, 1999) and greater persistence (e.g., Pelletier, Vallerand, Blais & Vallerand, 1988).

These findings indicate that (a) environments conducive towards competence, autonomy and relatedness will produce beneficial well-being and motivational consequences (e.g., intrinsic motivation) and (b) that different types of motivation yield differential health, well-being and performance outcomes. The following section details the ways in which issues of competence, autonomy and relatedness may be significant issues among athletes returning to sport following injury. Also, examined are findings regarding the consequences of different motivations to return to sport on return outcomes and athlete perceptions and emotions.

Return to Sport From Injury: A Self-determination Perspective

Competency Issues

In this section of the review, we examine the psychosocial literature dealing with competency related issues among athletes returning to sport from injury. We first examine research on athletes' cognitive and emotional responses to the return to sport following injury. We subsequently examine literature on the types of fears and concerns that may initiate negative reactions as a return to sport participation nears (Brewer, 2001b). Finally, we

turn our attention to interventions designed to address competence issues and concerns among athletes making a return to sport following injury.

Cognitive and emotional responses to a return to sport. Researchers have found that athletes typically move from a predominance of negative emotions to more positive ones as rehabilitation progresses (Dawes & Roach, 1997; Leddy, Lambert, & Ogles, 1994; McDonald & Hardy, 1990; Quackenbush & Crossman, 1994; Quinn & Fallon, 1999; Smith, Scott, O'Fallon, & Young, 1990). The existence of negative cognitions and emotions at the completion of athletes' physical recovery and upon re-entry into sport, however, has been reported in five investigations (Crossman, Gluck, & Jamieson, 1995; Ford & Gordon, 1998; Johnston & Carroll 1998b; Johnston & Carroll, 2000; Morrey, Stuart, Smith, & Wiese-Bjornstal, 1999).

Crossman et al. (1995) monitored the emotional responses to injury of 30 male athletes during four stages of recovery, including: (a) the day of the injury, (b) the following day, (c) halfway through rehabilitation, and (d) the day of return to competition. They found that while 13% of injured athletes experienced fear during rehabilitation, a significantly higher number (40%) reported the same emotion upon return to competition. Morrey et al.'s (1999) investigation of recreational and elite level athletes ($n = 27$), also revealed that competitive athletes ($n = 10$) experienced greater mood disturbance than recreational athletes ($n = 17$) upon receiving medical clearance to return to sport following an anterior cruciate ligament injury (ACL). In particular, they found that anger, frustration and boredom contributed to overall mood disturbance (measured by the Emotional Responses of Athletes to Injury Questionnaire) when competitive athletes were cleared for competition.

In support of these findings, people more involved in sport and exercise prior to their injury reported higher levels of confusion at the end of rehabilitation (Johnston & Carroll, 2000). Johnston and Carroll (2000) postulated that those more involved in sport prior to

injury may have experienced greater confusion upon re-entry into sport because they had greater information needs and experienced confusion when such needs were not met. The researchers argue that those more involved in sport and exercise may need greater information about alternative ways to help maintain aerobic fitness and how to regain their previous high level of physical functioning. Highly committed athletes may be more confused at the end of rehabilitation because they know that they are still a long way from attaining the status they had before their injury (Johnston & Carroll, 2000). This interpretation was supported by the finding that those more involved in sport perceived their recovery to be less at the end of rehabilitation, compared with those less involved.

Finally, the existence of negative emotional responses regarding a return to sport was reported in Ford and Gordon's (1998) survey of sport trainers and athletic therapists from Australia ($n = 53$), New Zealand ($n = 11$) and Canada ($n = 32$). According to trainers and therapists in this investigation, the most significant dysfunctional cognition displayed by athletes involved wanting to return to play as soon as possible. This was perceived as dysfunctional because it was often manifested before the injured athlete was fully recovered. Furthermore, lack of confidence (e.g., fear of re-injury) upon return to competition and anxiety regarding the consequences of a return to sport from injury were also perceived by physiotherapists and trainers to be dysfunctional cognitions and emotions displayed by rehabilitating athletes.

These findings indicate that a return to sport following injury may elicit negative cognitive and emotional responses. The findings also indicate that these negative reactions to a return to sport may be particularly pronounced among elite/competitive performers. These individuals may have special informational needs and may be recovering under different circumstances (e.g., more external pressures to return) than non-competitive or recreational athletes. Negative reactions as a return to sport participation nears may be related to

competency based fears and concerns (Hardy, 1992). Researchers in the aforementioned investigations have proposed that increased levels of negative affect when cleared for competition, *may* be due to uncertainties about the quality of future performance (i.e., an inability to perform to pre-injury levels), fear of failure, and the possibility of re-injury. Morrey, et al. (1999) also suggested that elevated negative mood states at the completion of rehabilitation may, in part, be the result of missing the challenge of sport.

Competency based fears and concerns. Anecdotal/clinical reports as well as empirical research indicate that elevated negative mood states and appraisals among returning athletes may be rooted in competency based fears and concerns associated with that return. Table 1 presents a summary of return-to-sport fears and concerns reported in the anecdotal and empirical literature. As is apparent from this table, there is tremendous similarity in terms of the fears and concerns reported. Clinical work with athletes returning from injury has shed light on some of the key fears, concerns and difficulties associated with a return to sport from injury. This body of literature also provides support for SDT theoretical contentions regarding the importance of meeting athletes' competence needs. The two most common fears cited in the applied literature are a fear of re-injury and a fear regarding the ability to return to pre-injury levels (see Table 1).

Results from empirical studies support these contentions indicating that the stress associated with coming back from an injury may be largely related to the fear of re-injury and concerns about performing to pre-injury levels (Table 1). These investigations have revealed that the fear of re-injury may be a source of concern prior to and after a return to competition (e.g., Bianco, Malo, & Orlick, 1999; Gould et al., 1997a). For some athletes re-injury fears may persist for years after the return to sport (Bianco et al., 1999; Gould et al., 1997a). For example, a U.S. skier stated:

You get scared to just let things go and go for it and not have that fear of 'Oh God, I could get hurt again.' That alone takes a really long time to get over.... Some girls are

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good at it. But for me, it took awhile... I think it took... I am just now back to where I was and you know, it's been three or four years (Gould et al., 1997a, p.368).

Re-injury fears may manifest themselves in several ways including: being hesitant, holding back, not giving 100% effort and exertion, being cautious of injury-provoking situations (especially situations similar to the context of occurrence), and heavy taping of the injured body part (Johnston & Carroll, 1998b). Re-injury fears may be particularly salient among athletes with a history of injury to a particular body part, as they may have a heightened awareness of their physical weakness (Johnston & Carroll, 1998b).

A number of other return-to-sport concerns and difficulties have been reported. The issue of malingering among injured athletes has been cited as potentially problematic in the applied literature (Rotella, Ogilvie, & Perrin, 1993). According to Taylor and Taylor (1997), the athlete who perceives the return to sport as threatening may engage in efforts to avoid the return (i.e., malinger) to manage their substantial doubts, fears or concerns. Athletes may also be fearful of not meeting other's performance expectations, letting down teammates or the coach, and concerns over upholding one's reputation (Podlog & Eklund, 2006a). These concerns may be related to athletes' need to create a desired impression of "athletic competency" in the minds of others (Podlog & Eklund, 2006a).

Once athletes return to competition, negative social comparisons regarding one's performance in relation to others, losing to fellow competitors one used to beat, and frustrations regarding competition routines may be problematic (Bianco et al., 1999; Gould et al., 1997a; Podlog & Eklund, 2006a, in press). One athlete in Gould et al's. (1997a) investigation reported:

I think the toughest thing overall was learning how to compete again because just being away from that whole situation for so long you just...you forget everything... you forget your routine... the routine you do in the start to prepare mentally and everything. It kind of seemed like that was all gone (p. 369).

An interesting comparison in Gould et al.'s (1997a) investigation was the stress source differences between successfully recovered skiers (i.e., those who achieved a world ranking equal to or better than their pre-injury ranking) and unsuccessful recovering athletes (i.e., those who failed to achieve a world ranking equal to or better than their pre-injury ranking). Those who were unsuccessful reported less attention/empathy from others, more negative relationships with others, and more physical concerns such as poor performance and being physically inactive. Successful performers were more likely, however, to report isolation as compared to the unsuccessful recoverers. Interestingly, the fact that only 7 of the 21 skiers made successful recoveries, in itself, suggests that returning to sport may have been difficult for many participants.

Gould et al. (1997a) indicate that because the “successful” versus “unsuccessful” comparison was “at best” suggestive, caution must be used in interpreting this finding for several reasons. First, using an athlete’s ranking as the sole determinant of a “successful” or “unsuccessful” return may be an overly simplistic or inaccurate way of determining an athlete’s ability to return to sport following injury. Moreover, participants who did not achieve a similar world ranking to their pre-injury ranking may still have had excellent performances or considered their return to sport successful based on subjective criteria other than their world ranking. Second, an athlete’s world ranking may have dropped because other competitors were performing well, not because that athlete was performing poorly. Third, it may have been the case that unsuccessful recoverers may have had more serious injuries or were not as physically recovered at the given time point as their successful counterparts.

Other difficulties such as poor performances and failing to meet personal expectations may be challenging issues for athletes following their return to competition (Bianco et al., 1999; Gould et al., 1997a; Podlog & Eklund, 2006a, in press). Coaches in Podlog and Eklund’s (in press) investigation indicated that athletes often had unrealistic expectations

regarding their ability to remain competitive with former opponents and to return to pre-injury levels. Coaches indicated that unrealistic expectations could result in a “vicious circle” of frustration, poorer performances and reduced confidence.

Clinical reports (Grove & Gordon, 1995; Taylor & Taylor, 1997; Wiese & Weiss, 1987) and case study investigations (e.g., Gordon & Lindgren, 1990) reveal that athletes may face declines in confidence following their return to sport from injury. For example, an elite Australian cricket fast bowler reported a lack of confidence upon his initial return to first grade cricket (Gordon & Lindgren, 1990). He later reported that his confidence both in his injury and his capabilities as a cricketer began to grow as he acquired more match experience. The use of a single subject design in Gordon and Lindgren’s (1990) investigation, however, prohibited any broad generalizations.

Support for this finding was garnered in a number of subsequent qualitative investigations (Bianco, et al., 1999; Gould et al., 1997a; Johnston & Carroll, 1998b; Podlog & Eklund, 2006a). In Bianco et al. (1999) publication based on interviews with 12 members of the Canadian Alpine Ski Team it was reported that skiers who had unrealistically high performance expectations for their return, and who failed to achieve these goals experienced drops in confidence. In terms of coping with threats to self-confidence, skiers emphasized the importance of recognizing one’s limitations and tailoring training programs and performance goals accordingly (Bianco et al., 1999). Skiers also reported the necessity of remaining patient and persevering during the first season back (Bianco et al., 1999). Athletes have indicated that overcoming confidence issues can provide them with opportunities to learn lessons about themselves as athletes and their ability to deal with adversity (Bianco et al., 1999; Podlog & Eklund, 2006a).

Actually testing the injured body part through sport involvement was the only coping strategy athletes in Johnston and Carroll’s (1998b) study reported using to alleviate their fear

of re-injury. For athletes in contact sports (e.g. rugby), these fears were allayed by making testing tackles. Some athletes avoided injury and performed well during their initial return to sport. These individuals reported that, given time, their confidence returned and their fear of re-injury diminished. Some participants, however, did not immediately perform well. A negative performance upon initial return was associated with depression and decreased confidence, which negatively affected sport performance.

Physical concerns have also been cited as particularly difficult among high level performers (Gould et al., 1997a; Podlog & Eklund, in press). Athletes in Gould et al.s' (1997a) investigation commented on the difficulty they experienced in adjusting to the physical changes brought about as a result of their surgeries. One skier remarked that after returning to skiing, she had to adjust to the alignment of her legs to accommodate her post-injury knee brace. The skier suggested that because this type of adjustment was not normal for her, seeing videos of her post-injury skiing performances "was hard, it was really hard (p.371)."

Findings from the extant literature on the psychosocial aspects of sport injury shed light on competence based fears, concerns and elevated negative mood states among athletes returning to sport from injury. They do, however, have a number of limitations. First, the published literature drawing attention to psychological issues associated with a return to sport from injury has been largely based on the applied work of practicing sport psychologists and not on any type of systematic and/or large scale scientific assessment. While these reports generally provide support for SDT theoretical contentions, they may provide a somewhat distorted picture given that the athletes under investigation were experiencing difficulties requiring clinical attention. Second, problems associated with recall bias and reconstruction of past events based on event outcomes are an inherent limitation of retrospective research (Brewer, Van Raalte, Linder, & Van Raalte, 1991). With the exception of Podlog and

Eklund's (2006a) investigation, the qualitative investigations discussed are all retrospective. Third, the extent to which athletes returning to sport following serious injury experience difficulty remains unclear. There may be a tendency in qualitative investigations to focus on the difficult aspects of the return to sport or upon athletes having significant difficulties. Qualitative research inherently has limited potential for generalizability and hence clarity on this account awaits epidemiological study. Fourth, Gould et al.'s (1997b) and Podlog and Eklund's (2005) investigations aside, these studies do not provide any indication of the factors leading to successful return to sport outcomes. Fifth, only Podlog and Eklund's (2006a) investigation was conducted with the a priori intent of examining the return to sport following serious injury. Thus, the particularities and specificities of athlete experiences in making a return to sport from injury may have been given insufficient attention or overlooked entirely in other qualitative studies. Finally, these studies do not offer a theoretical framework for interpreting or understanding athlete experiences in returning to sport following a serious injury (Podlog & Eklund, 2006a). The absence of theoretically grounded research compromises the ability of researchers to offer coaches and practitioners practical strategies to assist athletes with the return-to-sport transition.

Assisting athletes with competence issues: Intervention studies. A number of intervention strategies have been utilized to assist athletes with the difficulties associated with a return to sport following injury (Cox, 2002; Evans, Hardy, & Fleming, 2000; Rotella & Campbell, 1983; Suinn, 1975). These interventions have been utilized in an attempt to address feelings of physical or psychological incompetence or insecurity. Using a combination of deep muscle relaxation and imagery, Suinn (1975) assisted a recreational skier in overcoming her fear of reinjury following a knee operation. Rotella and Campbell (1983) used systematic desensitization to assist an injured varsity basketball player overcome her fear of re-injury. Systematic desensitization is a procedure designed to enable individuals

to effectively handle a specific fear or anxiety (Rotella & Campbell, 1983). The intervention began two days following the injury, and was repeated on three consecutive trials. Following completion of the intervention, both the athlete and her coaches reported an absence of any fears associated with the injury, increased self-confidence and an assertive level of play.

Positive intervention results have also been found in two investigations involving rugby players (Cox, 2002; Evans, Hardy, & Flemming, 2000). Using the behavioral technique of “successive approximation”, Cox (2002) initiated a 13- week graduated work program to assist a rugby player overcome his fear of re-injury and return to pre-injury fitness levels. Grounded in behavior modification techniques, successive approximation is a program which starts only one step ahead of where a client sees themselves at that time and they build up in small stages, each designed to ensure as much positive reinforcement as possible (Cox, 2002). Although it took quite a while (3 years), the athlete eventually achieved his ultimate goal of returning to first-class rugby. He also reported that he no longer had fears of hurting himself again and expressed a renewed sense of confidence and enjoyment for the game and for life in general.

Gaining confidence in the injured body part to meet the demands of sport and gaining confidence in situations where the injury occurred were also identified by Evans et al.’s (2000) rugby players as important aspects of re-entry. Moreover, gaining confidence in overall fitness levels was considered important. In order to meet the athletes’ confidence needs, Evans et al. (2000) employed several intervention techniques such as simulation training in structured practice, the use of imagery to prepare for specific game situations and verbal persuasion information given after successful experiences. Athletes participated in the intervention for varying lengths of time including five, seven and 12 months.

These athletes demonstrated the importance of regaining confidence in their injured body part in avoiding re-injury (Evans et al., 2000). It took six weeks for the two performers

who returned to playing to regain confidence in their injured body part, not to be distracted by injury-related cognitions and to focus fully on their performance. Although, this finding is based on intervention work with only three athletes, it supports Grove and Gordon's (1995) contention that confidence is vital among returning athletes. The time scale of six weeks to regain confidence also has relevance for coaches and sports personnel dealing with athletes returning from injury. While it is a much shorter time frame than skiers in Gould et al. (1997a & b) and Bianco et al.'s (1999) investigations took to overcome their fears, it highlights the fact that athletes may take some time before they are able to overcome injury related fears. It also reinforces the need for athletes, coaches and sports science personnel managing the return to sport to avoid setting unrealistic goals and expectations during this initial period (Podlog & Eklund, in press).

The aforementioned intervention studies indicate that a variety of psychological skills and techniques may be effective in assisting athletes with the difficult re-entry period. Despite the evident value of many psychological techniques in the return to sport from injury, a number of criticisms can be leveled against these studies. First, these interventions report on results based on small sample sizes (one-three athletes) and are therefore limited in their generalizability. Second, none of the interventions reported in the literature have employed the use of experimental control groups. Third, given that coaches and medical practitioners have been identified as ideally positioned to assist athletes with the return to sport (Johnston & Carroll, 1998b), it is surprising that no intervention studies have assessed the effectiveness of interventions administered by these individuals. If coaches and medical clinicians are likely to be the ones to provide such interventions, then studies examining their effectiveness as providers are needed. Finally, few researchers have explored the possible theoretical mechanisms that underlie these effects (Moran, 1994). Developing a better understanding of

why particular interventions are useful, under what conditions and when, requires examination of the suitability of theoretically grounded interventions.

Summary of competence issues. As indicated, SDT may be a valuable theoretical framework for understanding the key issues and processes regarding a return to sport from injury. Findings on competency based issues indicate that athletes fear re-injury, that they may have concerns about performing to pre-injury levels and that they may experience frustrations regarding an inability to meet performance expectations. A reduced sense of self-efficacy may be a consequence of these fears and frustrations. The finding that returning athletes have fears and concerns about how their body will withstand the demands of sport (Bianco, et al., 1999; Gould et al., 1997a) suggests that issues of physical competency may be significant. Athletes may also experience competency related concerns regarding future performances and the ability to fulfill personal or external expectations (e.g., Bianco, 2001; Feltz, 1986; Gould et al., 1997a; Johnston & Carroll, 1998a; Taylor & Taylor, 1997). Moreover, recognition that athletes suffer decreases in confidence and performance following their injury indicates that competency concerns may be significant once athletes resume their sport participation (Evans, Hardy & Fleming, 2000; Johnston & Carroll, 1998b). In short, competence issues may be at the forefront of athletes' minds as they make a return to sport following injury.

Autonomy Issues

Anecdotal reports and empirical investigations have revealed that autonomy issues may be significant among athletes making the transition back into full activity. These reports indicate that athletes may receive pressure to return to sport before they are physically or mentally prepared to do so. In some cases, a premature return to sport may occur as a result of inadvertent or more explicit pressures placed upon the athlete by a physician, trainer, or coach (Crossman, 1997; Taylor, 1985; Williams & Roepke, 1993). Many athletes may be

particularly susceptible to such pressures given that their judgment is often already clouded by a profound desire to get back into action as soon as possible (Crossman, 1997; Samples, 1987).

Empirical investigations with elite and professional samples have provided support for the notion that athletes may be pressured to return to sport (Bianco et al., 1999; Francis, Andersen, & Maley, 2000; Gordon, Milios, & Grove, 1991; Gould et al., 1997). For example, Bianco (2001), Bianco et al. (1999) and Gould et al. (1997a) highlighted the pressures facing Canadian and U.S. national team skiers making a return to sport following serious injury. Skiers in both studies reported returning prematurely in order to avoid missing an important upcoming competition. One athlete stated: “sometimes your competitive schedule doesn’t coincide with your recovery schedule, and you have to compete. Athletes feel like they have to do it. And you take that chance sometimes” (Bianco et al., 1999, p. 164). Skiers also reported returning to competition in order to avoid losing a spot on the team and because they felt pressure to prove themselves to the coaches (Bianco, 2001). Rookie skiers in Bianco et al.’s, (1999) sample whose positions on the team were uncertain reported succumbing to the pressure and decided to return to full activity sooner than they should have. In contrast, others were more cautious in their return after having seen other skiers come back from injuries too soon only to reinjure themselves. The skiers commented that much of the pressure they experienced to return could be alleviated if there were no performance expectations placed on them by the coach or specific return deadlines.

From a socio-cultural perspective, pressures to return to sport may emanate from the structure or environment of contemporary competitive sports. Athletes competing in a highly pressurized, “win at all costs” environment (Krane, Greenleaf, & Snow, 1997) may be highly susceptible to feelings of doubt, worry or incompetence. Because athletes are socialized in a culture that values achievement of the sport dream, consideration of the “sport ethic” (Hughes

& Coakley, 1991) as a factor affecting the quality of athletes' return to sport is an important issue (Wiese-Bjornstal et al., 1998).

An overconformity to the “sport ethic” along with a strong identification to the athlete role may be problematic (Brewer, Van Raalte, & Linder, 1993; Curry, 1993; Hughes & Coakley, 1991; Kleiber & Brock, 1992; Nixon, 1992). The “sport ethic” emphasizes sacrifice for the game, demonstrating character by playing with pain and injury, seeking distinction, and challenging limits. It is this “sport ethic” or “culture of risk” (Frey, 1991; Nixon, 1994a&b) that encourages athletes to believe that accepting the risks of pain and injury is their only legitimate or viable choice if they want to play. This ethos is created and perpetuated by coaches, sports fans and the media, all of whom emphasize the need to “pay the price”, to “play with pain” and to “shoot for the top” (Hughes & Coakley, 1991). Messner’s interviews with 30 male former high school and collegiate athletes (1992) and Young, White and McTeer’s (1994) in-depth interviews with 16 former and current Canadian adult male athletes revealed that external pressures and threats to masculine identity were primary motivations for “sacrificing” one’s body and risking re-injury. Values of the contemporary sports world may be such that athletes who refuse to play injured are negatively evaluated. In this sporting context, athletes who play with injuries are praised as “courageous” and those who return to play after serious injury are seen as being “dedicated to the game” (Hughes & Coakley, 1991; Messner, 1992).

Many athletes internalize these cultural beliefs linking pain tolerance with character and rationalizing pain and injury as a routine and uneventful “part of the game” (Curry, 1993; Nixon, 1992, 1993; Messner, 1990). Internalizing this ethic only serves to “normalize” injury and pain and to reinforce the belief that one must not allow pain or injury to stand in the way of accomplishing athletic goals (Curry & Strauss, 1994). Athletes with a foreclosed athletic identity may be among those most likely to “normalize” pain and injury (Brewer et al., 1993;

Hughes & Coakley, 1991). Ultimately, this strong identification to the athlete role can lead players to return to sport from injury even when it is contrary to their physical (and possibly their psychological) well-being and long-term health. This phenomenon of sacrificing one's body for sport achievement was supported by Curry's (1993) case study of a US college wrestler.

Knowledge that athletes may receive (and often internalize) external pressures to return to sport from injury (e.g., Frey, 1991; Messner, 1992; Nixon, 1992) suggests that one's level of autonomy in returning to sport may play an important role in the outcome of that return. Anecdotal reports indicate that athletes who are pressured to return to sport before they are physically and/or psychologically ready to do so (i.e., who lack autonomy), may have a number of detrimental consequences once they resume sport participation (e.g., Grove & Gordon, 1995; Williams & Roepke, 1993). For example, pressures to return to sport may lead to increased anxiety and tension which can lead to an unnecessary focus on the injured area, an inability to concentrate on performance and an inability to respond to task-relevant cues (Andersen & Williams, 1988; Feltz, 1986; Petitpas & Danish, 1995; Rotella & Heyman, 1986; Williams & Roepke, 1993). These problems may in turn increase the likelihood of one or more of the following upon re-entry into sport: (a) general depression which can weaken motivation and the desire to return to competition (Rotella, 1982) (b) a struggle to re-establish technical skills (Rotella & Heyman, 1986) (c) guarding or bracing of the injured area (Gould & Udry, 1994) (d) tentative or hesitant play (Petitpas & Danish, 1995) (e) lowered confidence resulting in a temporary and/or permanent performance decrement (Grove & Gordon, 1995; Hodge & McNair, 1990) and (f) re-injury or injury to another body part (Taylor, 1985).

Empirical support for the contention that autonomy levels may influence return-to-sport outcomes has been garnered in the literature (Bianco 2001; Bianco, al., 1999; Gould et

al., 1997b; Podlog & Eklund, 2005). Skiers in Bianco (2001) and Gould et al.s', (1997a&b) investigations who reported pressures to return to sport (i.e., those less autonomous) also indicated less favorable return to sport outcomes (i.e., re-injury, performance decrements, reduced confidence). Rookie skiers who admitted to returning too soon, all suffered further injuries that they attributed to that early return (Bianco, 2001). Gould et al. (1997b) found that patience and taking it slowly was cited more by successful than unsuccessful recoverers from injury.

Increased autonomy has also been associated with more positive cognitive and emotional responses to a return to competition following injury among 225 professional Australian Rules Football (AFL) players (Podlog & Eklund, 2006b). Athletes in this experimentally designed scenario based study indicated that higher levels of self-determination (i.e., more intrinsic forms of motivation) and decreased re-injury fears resulted in more positive appraisals and emotions when facing a return-to-competition following a serious injury. Additionally, more autonomous forms of motivation to return to sport were associated with more positive psychological outcomes (e.g., a renewed perspective on sport) in Podlog and Eklund's (2005) correlational investigation involving 180 high level athletes across a variety of sports and countries. Results from this investigation also revealed that more extrinsic forms of motivation were associated with negative psychological return outcomes such as reduced confidence, increased performance anxiety, and heightened re-injury fears (Podlog & Eklund, 2005). Although initial investigations reveal that higher levels of autonomy may result in beneficial return-to-sport outcomes more research is needed on this issue. Future research examining autonomy issues on the return to sport following injury is discussed in the fourth and final section of the paper.

Summary of autonomy issues. The aforementioned findings indicate that athletes may have differing levels of autonomy in returning to training and competition following injury.

Undoubtedly, there are many athletes who return to sport for a variety of identified and intrinsic motivations (e.g., wanting to help the team win, demonstrating athletic prowess, the joy and satisfaction of playing the game). Nonetheless, the literature discussed in this section of the review reveals that athletes can also face external pressures to return to sport from a variety of sources including coaches, teammates and fans. Given many athletes' profound desire to return to sport, as well as their internalization of dominant sport norms and beliefs (i.e., internalization of the "sport ethic"), it is not surprising that many athletes may be susceptible to external pressures to return to sport, possibly before they are physically or psychologically ready to do so. Regardless of whether the athlete suffers from a lack of autonomy or enjoys relatively complete autonomy in returning to sport, it appears that autonomy issues may be prominent amongst athletes returning to sport following injury. Moreover, research examining the consequences of varying degrees of autonomy has found that the type of motivation to return to sport may have a significant impact upon athletes' psychological return outcomes (Podlog & Eklund, 2005), return appraisals and emotional responses (Podlog & Eklund, 2006b).

Relatedness Issues

Relatedness issues may figure prominently in the return to sport following injury. Injured athletes may often feel a sense of alienation and social isolation from their friends, teammates and fellow competitors (e.g., Ermler & Thomas, 1990; Gould et al., 1997a; Thomas & Rintala, 1989). Gould et al. (1997a) reported concerns such as a perceived lack of attention from the coach and teammates and feelings of intense isolation during recovery. U.S. skiers in Gould et al.'s (1997a) investigation reported feeling cut off from their coach, teammates, and familiar routines. They also indicated that a lack of social interaction with teammates was difficult during the recovery period. Feelings of alienation and isolation from teammates and training partners may figure prominently in athletes desire to return to sport

following injury (e.g., Brewer et al., 1993; Crossman & Jamieson, 1985; Ermler & Thomas, 1990; Kleiber & Brock, 1992; Petitpas & Danish, 1995).

Social support and assistance from a variety of sources (e.g., coaches and rehabilitation specialists) may act as prophylaxis against the isolation and alienation commonly associated with injury recovery and a return to sport (e.g. Bianco & Eklund, 2001; Andersen, 2001). Athletes have indicated that receiving support from physiotherapists and coaches was important for enabling them to cope with the difficulties associated with the return to sport transition (Bianco, 2001; Johnston & Carroll, 1998a). In particular, social support from coaches and physiotherapists was felt to be important for preventing a premature return to sport and in reassuring athletes about the success of rehabilitation (Bianco, 2001). Canadian national team skiers indicated the importance of receiving explicit instructions from the physicians and physiotherapists regarding what they could and could not do on returning to skiing (Bianco, 2001). Skiers suggested that physiotherapists needed to recognize that athletes tended to be very anxious to return to sport and that they often needed to be held back, a finding supported by Ford and Gordon (1998). Recognition on the part of physiotherapists that athletes may require social support intervention has been documented in the literature (Larson, Starkey, & Zaichowsky, 1996)

Social support has also been reported as helpful in easing athlete fears about oversteering the recovered body part, helping them set realistic performance expectations, building confidence and recognizing improvements (Bianco, 2001; Johnston & Carroll, 1998a). Athletes have suggested that coaches should avoid placing expectations on return performances and that it is important for coaches to verbalize their support during the transition period, particularly after a poor or inadequate performance (Bianco, 2001; Johnston & Carroll, 1998a).

Despite the fact that social support may be important for athletes during the return transition, athletes in Johnston and Carroll's (1998a) investigation reported an absence of appropriate feedback at this time. One informant stated:

I would have preferred more [informational support] from the physiotherapist to take me through this final stage of rehabilitation, more towards re-entry into sport. I didn't feel when I left rehabilitation I was back to the level I had been before I got injured, there was a big gap, and really I did not receive any expert or specific advice about how to train or build up the muscles... The rehabilitation required for a sports person is much more than that which is required for non-sports people (p.277).

In order to improve social support, Johnston and Carroll (1998a) contend that coaches should help organize physical training programs for injured athletes, counsel them on the difficulties associated with returning to competition, and, when appropriate, refer athletes to other professionals. In light of the fact that athletes may perceive a lack of social support regarding re-entry and physiotherapists' lack of training in appropriate intervention techniques, Johnston and Carroll (1998a) argue in favor of interventions by coaches and sport psychologists at the end of rehabilitation and re-entry into sport.

Summary of relatedness issues. The aforementioned studies reveal that the need for relatedness may be significant among returning athletes. Maintaining a sense of connectedness to coaches, teammates and training partners may provide a buffer against feelings of alienation and isolation. Moreover, findings reveal that coaches and rehabilitation specialists may be ideally positioned to provide social support and to keep athletes involved in their sport in meaningful ways (e.g., weight training with team members or involvement in team meetings) (Podlog & Eklund, in press). Not only have environmental supports for relatedness been linked with improved psychological functioning and well-being (Ryan et al., 1995) but the benefits of social support among recovering athletes are well understood (Bianco & Eklund, 2001).

*Implications for a Return to Sport Following Injury and Directions for
Future Research*

Implications for a Return to Sport Following Injury

Findings from the psychosocial literature on sport injury have several important implications for athletes returning to sport following a serious injury. First, they suggest that environments supportive of the needs for competence, autonomy and relatedness may yield beneficial return-to-sport outcomes (e.g., reduced anxiety levels, satisfaction with the return, quality performances, high levels of confidence, reduced re-injury rates). That is, the success of an athlete's return to sport from injury may be related to the degree to which the sporting environment meets the psychological needs of that returning athlete. As indicated, research guided by SDT supports the notion that environments supportive of these three needs may yield beneficial health and well-being consequences across a variety of life domains (see Ryan & Deci, 2000 for a review). Second, they indicate that the degree of autonomy athletes' have in returning to sport following injury (i.e., their motivations to return) may influence their return-to-sport outcomes (e.g., anxiety levels, confidence, perceptions of performance) (Bianco, 2001; Gould et al., 1997b; Podlog & Eklund, 2005, 2006b).

Finally, given the potential for psychosocial difficulties associated with a return from injury, the findings indicate the utility of establishing criteria to determine athletes' readiness to return to competition (Morganti, et al., 2001). Researchers and clinicians have suggested that return to sport criteria include: (a) a discussion of prospective return dates so athletes can begin to anticipate their return (Gieck, 1990); (b) approval from the sports medicine team that the athlete is physically ready to meet the demands of competition (Williams & Roepke, 1993); (c) an assessment of athlete's confidence levels as well as discussions about any fears or thoughts related to the return to sport (Williams & Roepke, 1993, Taylor & Taylor, 1997); and finally, (d) a discussion regarding who will make the final decision regarding when the athlete will return (Green, 1992). Such precautions would reduce the number of athletes

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returning who were overly anxious or otherwise psychologically unprepared to do so. Moreover, it would allow the athlete the opportunity to maximize his or her performance skills upon returning (Williams & Roepke, 1993). From a self-determination perspective return to sport criteria may be most useful when they address issues of competence (physical and psychological), autonomy and relatedness. This remains a profitable area for future research.

Directions for Future Research

Given the paucity of empirical research on the return to sport following injury, there remain numerous directions for future research. As Moran (2004) suggests, the return to sport transition and the psychosocial factors affecting the quality and experience of athlete re-entry into sport is an under-researched area in the sport injury domain. Findings from this literature review suggest that research guided by self-determination theory may prove useful in uncovering the key processes and dimensions of the return to sport following serious injury.

First, further research examining the potential benefits of more autonomous forms of motivation to return to sport is needed (see Ryan & Deci, 2000). Findings from Podlog and Eklund (2005) reveal that the motivation to return to sport may be an important factor shaping the return to sport experience. More research, however, is needed to validate these preliminary findings with heterogeneous athlete populations (e.g., non-contact sports, different age groups and genders, different performance levels and sports, and athletes from various nations). Moreover, given the potential for recall biases associated with the retrospective design used by Podlog and Eklund (2005), longitudinal research examining the association between motivations to return and return-to-sport outcomes is needed. Experimental research designs examining the causal connections between motivations to return to sport and return outcomes would be useful in this regard. Such research might

examine whether different types of motivation (e.g., more autonomous intrinsic motivation) to return to sport result in different return-to-sport outcomes.

Second, existing research indicates that the motivation to return to sport (Hughes & Coakley, 1991; Podlog & Eklund, 2005) and the fear of re-injury may be two key factors influencing the return to sport following injury (e.g., Bianco et al., 1999; Gould et al., 1997a; Podlog & Eklund, 2006b). More research examining the influence of other potentially salient variables such as age, gender, level of play (e.g., professional, elite youth, recreational), style of coaching or the type of sport on athlete appraisals, emotions and return outcomes, is needed.

Third, research that examines the meaning of “successful” versus “unsuccessful” return to sport outcomes is needed. In order to develop a better understanding of the factors affecting return to sport outcomes, research is needed to develop a clearer understanding of the types of outcomes athletes (and those trying to assist them) are trying to achieve. Qualitative research designs examining the meaning of these socially constructed categories would be useful in this regard. In line with SDT theoretical contentions researchers may wish to examine the extent to which notions of competence, autonomy and relatedness are important elements of the definition of “successful” versus “unsuccessful” returns.

Fourth, various interventions designed to assist athletes with return to sport fears and concerns have been employed (e.g., Evans et al., 2000; Rotella & Campbell, 1983; Suinn, 1975). These studies however, have been hampered by small subject numbers and a lack of well-controlled research designs. Moreover, despite the apparent efficacy of various psychological techniques in assisting returning athletes, the theoretical mechanisms underlining these effects remains unclear. Given initial empirical support for the utility of a self-determination perspective, well-controlled intervention studies guided by SDT principles would be useful for determining the effectiveness of particular intervention strategies. Studies

targeting athletes' need for competence (e.g., goal-setting interventions) autonomy (e.g., discussion sessions regarding motivations to return to sport), and relatedness (i.e., the provision of social support, role modelling) could be employed. Furthermore, research examining athlete perceptions of return to sport interventions is needed. Ultimately the effectiveness of any intervention strategy rests upon athlete perceptions of such strategies as helpful and their willingness to adopt them.

Fifth, research examining the mechanisms by which athletes are able to derive any significant post-injury benefits requires further exploration (Moran, 2004). Ensuring that the greatest number of athletes derive any possible benefits from their injuries requires a deeper understanding of how and why some athletes are able to make improvements (physical, technical and/or psychological) following their return to sport from injury. Along these lines, findings from Podlog and Eklund (2006) reveal that athletes who are successful in regaining their pre-injury capacities “do” certain things and/or adopt a certain mental approaches. More research however, is needed to determine the behaviors and mental approaches that facilitate successful return to sport outcomes. Initial attempts to examine this question (Gould et al., 1997b) are at best suggestive and require further examination.

Finally, much of the current literature on the return to sport from injury focuses on athletes' with acute injuries. Research examining the return-to-sport experiences of chronically versus acute injured athletes is needed. Longitudinal studies comparing the experiences of chronically injured versus acute injured athletes would be useful in this regard. Specifically, the salience of competence, autonomy and relatedness issues among chronic versus acute injured athletes could be compared at various time points. Future research guided by self-determination theory may provide valuable insights into the key issues and processes surrounding a return to sport following injury.

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Table 1
Competency Based Fears and Concerns Among Returning Athletes

Report/ Study	Sample Size	Type of athlete/ coach	Type of sport	Criteria for inclusion	Design	Findings/ Results
Rotella (1982)	N/A	N/A	N/A	N/A	anecdotal	(1) rational or irrational fears may lead to an inability to concentrate which may in turn lead to reinjury or injury to another body part (2) systematic desensitization may be used to manage anxieties about return to competition
Rotella (1985)	N/A	N/A	N/A	N/A	anecdotal	(1)athletes may be overeager to return to competition and end up hurting themselves (2) self-imposed pressures to return to sport (3) concerns about living up to the expectations of others
Taylor (1985)	N/A	N/A	N/A	N/A	anecdotal	(1) fear of reinjury may lead to attentional distractions increasing likelihood of reinjury and inhibiting performance (2)importance of realistic goals and performance expectations for comeback efforts
Rotella & Heyman (1986)	N/A	N/A	N/A	N/A	anecdotal	(1) physical and psychological readiness to return may not coincide (2) anxiety upon initial return to competition can lead to reinjury, injury to another body part, lowered confidence resulting in temporary/permanent confidence decrements and general depression which can weaken motivation

Feltz (1986)	N/A	N/A	N/A	N/A	N/A	anecdotal	(1) anxieties about returning to competition such as lacking confidence in ability, irrational thoughts which lead to an inability to concentrate on performance, or fear of future injury (2) techniques such as desensitization, hypnosis, stress inoculation may be used.
Samples (1987)	N/A	N/A	N/A	N/A	N/A	anecdotal	(1) athletes may be prone to trying to return to sport too quickly (2) recommends giving athletes progressive goals during the return to sport
Wiese & Weiss (1987)	N/A	N/A	N/A	N/A	N/A	anecdotal	(1) athletes must feel confident about their recovery before returning to sport (2) doubts about performing to pre-injury levels, re-injury (3) sports medicine practitioners should provide athletes with information on physical recovery before return to sport
Booth (1989)	N/A	N/A	N/A	N/A	N/A	anecdotal	(1) assumption that athletes who are physically ready to return to sport are psychologically ready (2) athletes may fear re-injury on return to competition, losing a position on the team, losing a job (profession) or a scholarship
Gieck (1990)	N/A	N/A	N/A	N/A	N/A	anecdotal	(1) athletes have described nightmares, fears and anxiety about returning to competition (2) suggests a discussion of prospective return dates so athletes can begin to anticipate their return
Gordon & Lindgren (1990)	N = 1 (1 male)	professional	cricket	Back surgery (Buck's procedure)		case study	(1) athlete experienced confidence problems regarding reading to return to competitive cricket (2) directions for future research: nature and extent of decision process used to return athletes to full activity? and do medical personnel return athletes to full activity on the philosophy 'if the body is ready/healed the mind is also'?

Hodge & McNair (1990)	N/A	N/A	N/A	N/A	anecdotal	(1) sports medicine team needs to monitor injured athletes' anxiety level about returning to competition, degree of self-confidence, and motivation to return to competition (2) athletes who return before they are psychologically prepared may incur re-injury, perform poorly due to a lack of confidence, experience fear, anxiety, self-doubt and general depression leading to greater psychological problems (3) social support group can be valuable source of information regarding athletes psychological readiness to return to competition
Green (1992)	N/A	N/A	N/A	N/A	anecdotal	(1) imagery can be utilized to help facilitate return to competition (2) discussion regarding who will make the final decision regarding when the athlete will return is necessary (3) a progression of sport specific skills should be identified that represent "being back" to the athlete
Rotella, Ogilvie, & Perrin (1993)	N/A	N/A	N/A	N/A	anecdotal	(1) malingering may occur as a result efforts to avoid returning to sport
Williams & Roepke (1993)	N/A	N/A	N/A	N/A	anecdotal	(1) athletes returning to sport before they are physically or psychologically ready for a variety of reasons (e.g., pressures from the coach, athlete feels they know their body's limitations and capabilities better than others) (2) unrealistically high performance expectations may lead to negative cognitions (i.e. self-talk) and emotions (e.g. frustration, anger, doubt, fear) (3) need for assessment of psychological readiness to return to sport (e.g., assessing confidence levels, soliciting opinions of treatment team)

Gould & Udry (1994)	N/A	N/A	N/A	N/A	anecdotal	(1) athletes who are psychologically unprepared to return may be prone to “guarding/ bracing” of injured area
Petitpas & Danish (1995)	N/A	N/A	N/A	N/A	anecdotal	(1) athletes who return before they are psychologically ready may be more hesitant in play which translates into performance decrements, which can erode confidence and lead to more stress and frustration
Crossman (1997)	N/A	N/A	N/A	N/A	anecdotal	(1) pressures to return to sport emanating from the coach or from the athlete themselves
Gould, et al.(1997a)	N = 21	International	U.S. alpine and freestyle skiers	Season ending injury (out for ≥ 3 months)	Retrospective qualitative interviews	(1) negative social comparisons (losing to others one used to beat, frustrations over poor performances) (2) social concerns (lack of attention from coaches, isolation from teammates) (3) difficulties adjusting to physical changes (4) concerns over losing spot on the team (5) doubts about readiness to return to competition (6) “unsuccessful” skiers reported more lack of attention/empathy, negative relationships, poor performance and physical inactivity; successful skiers reported more isolation
Gould, et al. (1997b)	N = 21	International	U.S. alpine and freestyle skiers	Season ending injury (out for ≥ 3 months)	Retrospective qualitative interviews	(1) higher percentage of “successful” recoverers managed thoughts and emotions, visualized/mentally prepared, and were patient/took it slow (2) “unsuccessful” returnees sought and used social resources and used other athletes as models as their primary coping strategies

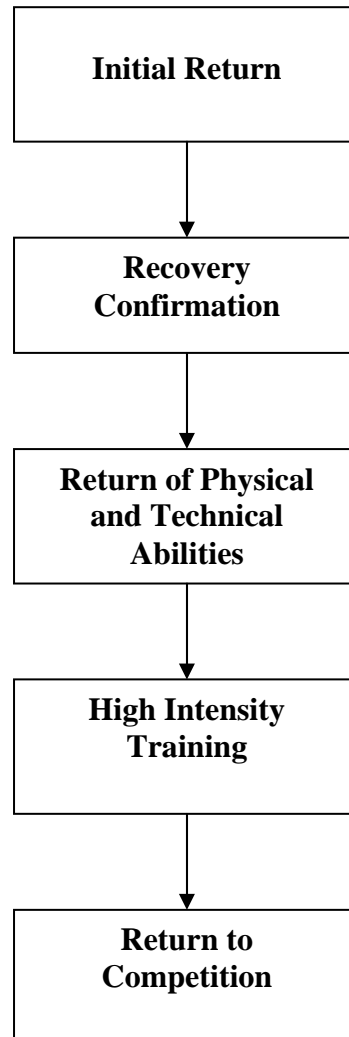
Taylor & Taylor (1997)	N/A	N/A	N/A	N/A	anecdotal	(1) return to sport model (2) pressures to return to sport from coaches, family members, teammates (3) athletes can interpret the return to sport as a threat or challenge
Johnston & Carroll (1998a)	N = 12 (8 male, 4 female)	University, recreational, county, national league, professional	Rugby, soccer, football, basketball, badminton, swimming, squash	Rating of injury severity (M = 3.5 on a 1 = low to 5 = high scale)	Single and repeat qualitative interviews	(1) athletes overzealous to return to sport (2) social support may be important for challenging athletes not to return prematurely (3) athletes reported a lack of informational support upon re-entry into sport (4) social support was important for helping athletes regain confidence following perceived poor performance (5) not all participants were physically or psychologically prepared to return to sport
Johnston & Carroll (1998b)	N = 16 (11 male and 5 female)	Competitive & recreational	Rugby, soccer, Football, basketball, badminton, swimming, running, squash	A severe (i.e. unable to participate in sport for ≥ 21 days) within the past 12 months	Unstructured qualitative interviews and a demographic questionnaire	(1) impatience to return to sport related to exposure to others playing sport and exercise withdrawal effects (2) lower confidence upon return to sport related to fear of re-injury or injury to another body part (3) testing the injured body part was only strategy used to alleviate fear of reinjury
Bianco, Malo, & Orlick (1999)	N = 12	International	Canadian alpine sky team members	Out of sport participation for ≥ 1 month	Retrospective qualitative interviews	(1) possibility of losing a spot on the team influenced decisions to return to competition prematurely (2) re-injury fears were prominent for premature returnees (3) high expectations and disappointing results contributed to drops in confidence (4) maintaining a positive perspective and belief in ones' abilities allowed athletes to stay motivated during return to sport difficulties

Bianco (2001)	N = 10	International	Canadian alpine sky team members	Out of sport participation for ≥ 1 month	Retrospective qualitative interviews	(1) pressures to return to skiing before full recovery (2) coping with fear of reinjury, disappointing results, doubts about careers (3) unrealistic expectations among those who believed that discipline in rehabilitation would automatically lead to performance at pre-injury levels (4) failure to achieve goals resulting in confidence decrements (5) social support from coaches and physiotherapists important for remaining motivated, confident about abilities, and one's spot on the team
Podlog & Eklund (2005)	N = 180 (117 male, 63 female)	International, Canadian Interuniversity sport, state/provincial, professional	A variety of winter (e.g., luge) and summer sport athletes (athletics)	Time loss ≥ 2 months competitive absence	Correlational survey design	(1) greater intrinsic motivation associated with a renewed perspective on sport (2) extrinsic motivation positively associated with negative psychological return-to-sport outcomes (i.e., reduced confidence, increased performance anxiety, and heightened re-injury fears) (3) results support SDT theoretical contentions regarding positive psychological outcomes associated with greater intrinsic motivation
Kvist, Ek, Sporrstedt & Good (2005)	N = 62 (34 male, 28 female)	Not indicated	Not indicated	Age 16-35, unilateral injury, no previous ACL recon, no further knee injury since surgery	Correlational survey design	(1) patients who did not return to pre-injury activity levels had more fear of re-injury (2) high fear of reinjury correlated with low knee-related quality of life (3) fear of re-injury must be considered in the rehabilitation and evaluation of effects of ACL reconstruction

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Podlog & Eklund (2006a)	N = 12 (7 male, 5 female)	International, semi-professional	Athletics, Ice-hockey, netball, field-hockey, rowing, swimming, field-hockey, Australian Football, soccer	Time loss \geq 2 months competitive absence	Longitudinal qualitative interviews (up to 8 months post return-to-competition)	(1) competence (e.g., ability to achieve short/long-term goals, physical readiness to resume competitive activity) autonomy (e.g., degree of personal control regarding return to competition) and relatedness (e.g., not feeling like a “true” team member, social support, role models) issues were salient in athlete comments throughout their return to sport from injury
Podlog & Eklund (in press)	N = 14 (10 male, 4 female)	Professional coaches Western Australian Institute of Sport & New Zealand National team/coaches	Squash, athletics, swimming, triathlon rugby, field-hockey, water polo, gymnastics, rowing, netball	Full-time professional coach Experience coaching \geq 1 elite athletes with injury experience	Qualitative interviews	(1) coach decisions regarding athlete return to sport based on formal medical clearance; the importance of effective coach-practitioner communication regarding return decisions was highlighted (2) coaches indicated that physical (e.g., fear of re-injury, regaining fitness) social (e.g., negative social comparisons, pressures to return) and performance stressors (e.g., reaching pre-injury levels, losing spot on the team) may have an important impact on the quality and experience of athlete’s return to sport (3) coaches role in assisting athletes with the return transition may include individualized training sessions, keeping athletes involved in sport and providing social support
Podlog & Eklund, (2006b)	N = 225 (225 males)	Professional	Australian Rules Football (AFL)	Current member of an AFL club	Experimental (hypothetical scenarios)	(1) greater self-determination regarding return to competition resulted in more positive cognitive and emotional responses (2) increased fears of re-injury evoked more negative emotional responses (i.e., greater resentment and lower levels of relief and happiness) (3) results support SDT theoretical contentions regarding positive health and well-being outcomes associated with increased self-determination



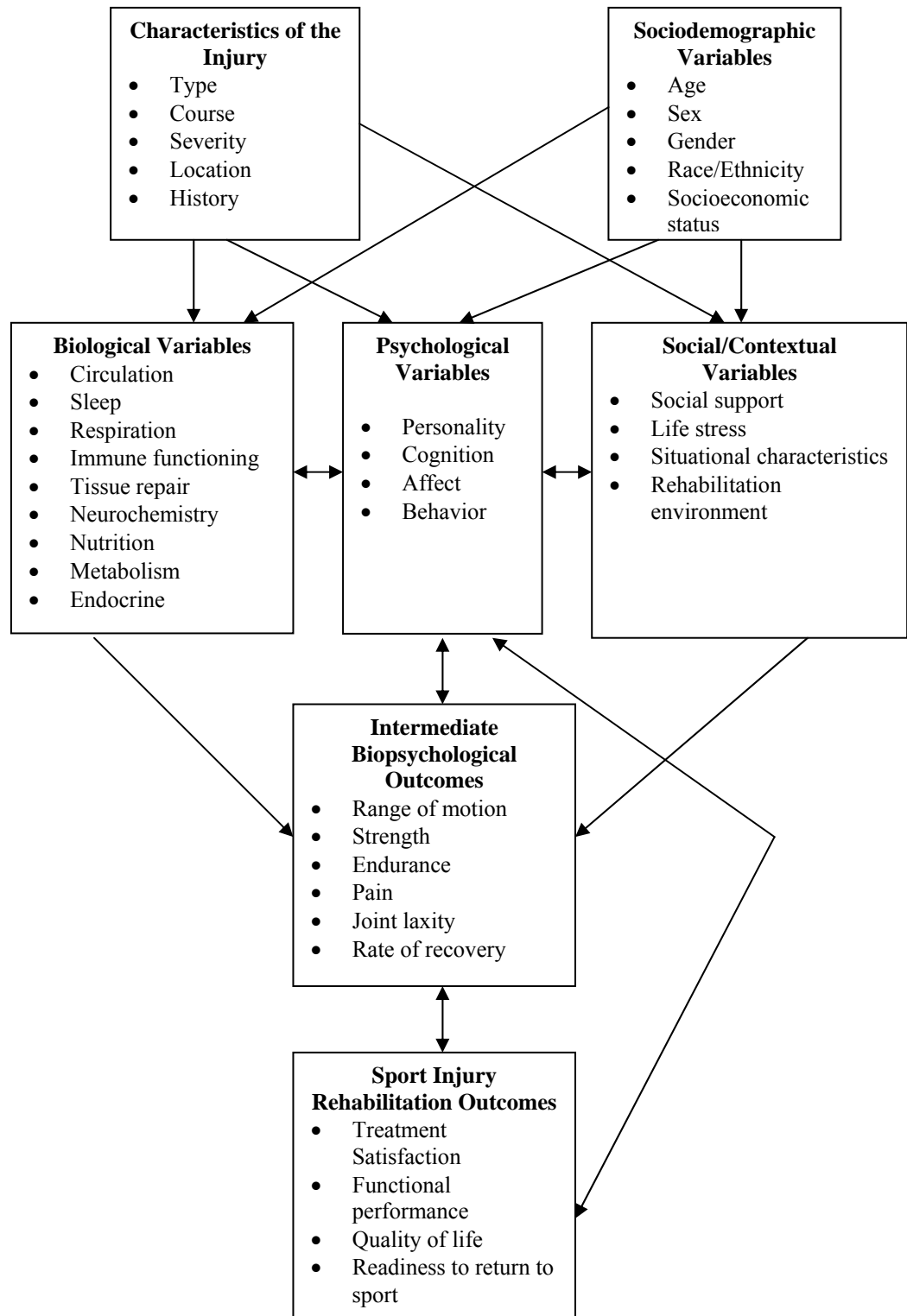


Figure Captions

Figure 1. Stages of return to sport. From Taylor, J., & Taylor, S. (1997). *Psychological approaches to sports injury rehabilitation*. Gaithersburg, MD: Aspen Publication.

Figure 2. A biopsychosocial model of athletic injury rehabilitation. From “Psychological aspects of sport injury rehabilitation: Toward a biopsychosocial approach” by B.W., Brewer, M.B. Andersen, J.L. Van Raalte, *Medical Aspects of Sport and Exercise*, edited by D. Mostofsky and L. Zaichkowsky, Morgantown, WV: Fitness Information Technology.