

PROJECT M.O.T.A.R: Motivation Towards Athlete Recovery

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Dedication

This thesis is dedicated to those taken from us much too soon;

Wyatt Stasiuk and Evelyn Burris

We know you are watching over us. We love you and miss you.

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Sarah Deck

Abstract

Social contagion is an important phenomenon that looks at the spread of ideas, attitudes and behaviours in a group through imitation and conformity (Colman, 2014). To date, this phenomenon has received limited research attention in sport settings. The purpose of this study was to understand the role of social contagion on motivation of athletes, athletic therapists and coaches in the process of injury recovery. Using a multiple groups, post-test only, randomized experimental design (Trochim, 2006), data was collected from participants ($N = 145$) on a single occasion. A Multivariate Analysis of Variance, as well as follow-up Analyses of Variance revealed significant differences between groups in perceived Athlete Interest in Therapy ($p < .01$), perceived Positive Behaviour Change ($p < .01$), perceived Therapist Interest ($p < .01$), and perceived Therapist Efficacy ($p < .01$). The results showed that intrinsically motivated athletes and therapists scored higher in terms of perceived Interest and perceived Behaviour Change. A difference was also found when athletes were extrinsically motivated and therapists were intrinsically motivated in terms of perceived Behaviour Change, but not perceived Athlete Interest, compared to when both were described as extrinsically motivated. Overall, these findings imply that motivational orientations of the therapist during injury recovery therapy have no influence on athlete motivational orientations in terms of overall interest in athletic therapy.

Keywords: Social Contagion, Motivation, Athlete Recovery

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Introduction

In one year, high school athletic participation increased by more than 100,000 students in the United States alone (Tolbert, McIlvain, Giangarra, & Binkley, 2011). As interest and participation in sport increases so do the number of injuries; both serious, non-serious, and overuse (Tolbert et al., 2011). These injuries are not just common in professional athletes, but can happen at any time and at any age. Although it is generally believed that the risk of injury increases with age; this increased risk of injury with age has been shown to be sport specific, such as in football, hockey, and soccer (Caine, Maffulli, & Caine, 2008). In many countries, sports and recreational injuries are the leading cause of injury in youth (Caine, Purcell, & Maffuli, 2014). Specifically looking at meniscal injuries in a sample of high school students from America during six academic years, it was noted that only three sports reported absolutely no meniscal injuries, and that there was an overall injury rate of 5.1 per 100,000 for this type of injury (Mitchell et al., 2016). Swenson, Collins, Fields, and Comstock (2013) focused on ligament injuries in the ankle in high school athletes and reported an overall injury rate of 3.13 injuries per 10,000 athletes. Research has also shown that for both high school and collegiate athletes, injury rates appear higher in competition than practice (Tolbert et al., 2011) and more specifically for collegiate athletes, pre-season injury rates were higher (6.3 per 1000) than in-season (2.3 per 1000), and post-season occurrences (1.3 per 1000; Agel & Schisel, 2013). In addition, injury rates among collegiate athletes also increased based on level of competitive involvement from Division III (6.0 per 1000), Division II (6.1 per 1000), to Division I (6.8 per 1000).

Similar trends have been seen among Canadian university athletes. Meeuwisse, Hagel, Mohtadi, Butterwick, and Gordon (2000) looked at a sample of Western Canadian football players from 1992 to 1997, and found that the number of athletes injured each year ranged from 53.5% to 60.4%. For these athletes, knees were the most frequently injured body part, and also cost twice as much time out of sport compared to other injuries (Meeuwisse et al., 2000). In an additional study, Meeuwisse, Sellmer and Hagel (2003), looked at intercollegiate Canadian basketball injuries over two years; for all combined types of injuries, there were 4.94 injuries per 1000 athletes. Consistent with NCAA based research and Meewisse et al. (2000) the knee had the highest injury rate when injuries resulted in seven or more sessions of time loss (Meewisse et al., 2003). Overall, it appears that injury rates among Canadian athletes parallel those from other countries where sport is a popular pursuit.

Given the aforementioned prevalence of injury rates across a broad spectrum of competitive levels of sport, it is hardly surprising that readiness (both physical and psychological) to return to sport after injury has become a focal point of sport psychology research (Podlog & Eklund, 2006). If athletes do not receive proper treatment, both overuse and recurrent injuries can occur (or reoccur). Overuse injuries (i.e., caused by inadequate attention to the initial injury and/or insufficient recovery time; Roos et al., 2015) have incident rates of 1.64 per 10,000 in high school athletes, and 5.36 per 10,000 in collegiate athletes. In collegiate athletes experiencing an overuse injury, 5.2% required surgery, and 20.1% lost more than 21 days of training in their specific sport (Roos et al., 2015), implying that these overuse and recurrent injuries are becoming more problematic for athletes wishing to compete in sport. Previous injuries can also be linked to future

injuries for athletes. For example, Caine et al. (2008) report that the history of concussions is an important factor in predicting future concussions. Previous injury (within one year) in soccer players, football players and cheerleaders, increased their likelihood for risk of injury in the future across all groups (Caine et al., 2008). One factor contributing to these risks is inadequate rehabilitation (Caine et al., 2008). Therefore, given the prevalence of injuries occurring at multiple levels of sport competition, combined with the need for athletes to recover physically (and psychologically) in order to return to sport, it is becoming increasingly vital to understand the factors that contribute to optimizing recovery from sport-related injuries.

Rehabilitation Rates in Sport

With interest and participation rates increasing in sport, it is surprising that adherence rates to programs of rehabilitation therapy remain comparatively low (between 6% and 40%), even though the benefits to athletes are numerous (Bassett, 2015). Some factors that may influence adherence to therapy include the complexity of intrusive treatments, the influence of pain, the athlete's own beliefs regarding the injury itself, and the athlete's motives to continue participating in sport (Bassett, 2015). These motives can include many psychological factors that are seen as important to promoting adherence to any rehabilitation program, such as, self-efficacy, goal setting, and vicarious experiences of others (Bassett, 2015). Since motivation is focused on 'why' people take action (Deci & Ryan, 2002), more focus on its role in rehabilitation adherence seems warranted. One theory, which helps to explain the different motives that can impact adherence decisions, and why some choose to pursue activities while others resist, is Self-Determination Theory (SDT; Ryan & Deci, 2000).

Role of the Athletic Therapist

Athletic therapists as healthcare professionals provide assessment, prevention, emergency management, and rehabilitation of injuries through different modalities and education (What is Athletic Therapy?, n.d.). Student therapist (students who work with Canadian varsity athletes) may play a more psychological role in their relationship with athletes who may often be peers (Deal & Shields, 2015). Previous research using structured interviews notes both student athletic therapists and varsity athletes understood the importance of the role of the student athletic therapists, as well as, supported the belief that goal-setting is a key component during injury rehabilitation (Deal & Shields, 2015). Athletes and student therapists indicated more openness and trust due to the peer-level relationship, increasing contact on and off the field of play, which proved to help with adherence rates to rehabilitation therapy. Overall, it is likely that athletic therapists play a prominent role via either the mechanical (e.g., providing a sense of support to the athlete during a difficult period in their sporting history) processes involved in sport injury recovery.

SDT: A framework to understand motivation and adherence

A significant amount of research has been conducted on motivation in sport for the purpose of understanding ‘why’ some athletes show an enduring desire to pursue their sport whereas others quit or lose interest (Rocchi, Pelletier, & Couture, 2013). Motivation is a complex phenomena involving many different factors that underpin action (Ryan & Deci, 2000). SDT (Ryan & Deci, 2000) is a broad framework that can be used to help further understand this phenomena across life domains, and apply this

understanding of motivation to research in sport (Rocchi et al., 2013) and injury recovery in athletes (e.g., Podlog & Eklund, 2006; 2007; 2009).

Motivation is to be moved to do something (Ryan & Deci, 2000) and within SDT it has been divided into two broad types, namely intrinsic motivation (motivated for reasons of enjoyment and pleasure; Ryan & Deci, 2000) and extrinsic motivation (motivated for external reasons such as rewards or pleasing another person; Ryan & Deci, 2000).

Within SDT (Ryan & Deci, 2000) these types of motivation can be further divided along a continuum of self-determination ranging from amotivation (to not be motivated at all or having no intention to act; Ryan & Deci, 1985; 2000) to extrinsic motives then intrinsic motivation (to be motivated for pleasure and enjoyment of the activity; Deci & Ryan, 1985; 2000). Understanding the motivational basis for a person's actions can be useful in predicting relevant consequences of their actions on indices such as learning, performance, personal experiences, and well-being (Ryan & Deci, 2000).

SDT is a global approach to understanding human motivation that is made up of several different mini-theories. A brief overview of these components of SDT is provided here to give some context for this study. Organismic Integration Theory (OIT; Ryan & Deci, 2000) dissects the different forms of extrinsic motivation into four different types of regulation; (a) External regulation (to have salience of intrinsic rewards or punishments; Ryan & Deci, 2000), (b) Introjected regulation (to have focus on one's ego/wanting approval from others; Ryan & Deci, 2000), (c) Identified regulation (to value the activity and have self-endorsement of goals; Ryan & Deci, 2000), and (d) Integrated regulation (to show congruency with ones goals; Ryan & Deci, 2000). Cognitive Evaluation Theory (CET; Ryan & Deci, 2000) posits that intrinsic motivation

is critical for understanding optimal behaviour and postulates the role of psychological need satisfactions in nourishing this type of regulation. One's well-being (and motivation) can be shaped by experiencing feelings of autonomy, competence and relatedness, which is the focus of Basic Psychological Needs Theory (BPNT; Deci & Ryan, 2000). Individual differences and orientations toward environments are accounted for by Causality Orientations Theory (COT; Ryan & Deci, 2000) within the SDT framework. COT examines a person's autonomy orientation, control orientation, and impersonal or amotivated orientation in relation to functional outcomes within and across life domains (Ryan & Deci, 2000). Goals, both intrinsic and extrinsic in nature, can be differentially linked with well-being through Goal Contents Theory (GCT; Ryan & Deci, 2000). Finally, Relationship Motivation Theory (RMT; Deci & Ryan, 2014) is also included in the SDT framework with a focus on the role of maintaining and developing close personal relationships (or 'relatedness' in SDT parlance; Ryan & Deci, 2000), and the amount of interactions one has with these relationships to promote (or forestall) well-being (Ryan & Deci, 2000). Collectively, these mini-theories further our understanding of the 'how' and 'why' people are motivated to do (or not do) particular behaviours or actions.

One area of research in sport where SDT has been applied is to investigate the role of motives in return-to-sport competition after sustaining an injury. Podlog and Eklund (2006; 2007; 2009) have spearheaded this line of research in a series of studies examining return-to-sport after serious injury. In three qualitative studies, using both competitive amateur, and semi-professional athletes (Podlog & Eklund, 2006; 2009), as well as professional coaches (Podlog & Eklund, 2007), this line of research has examined an

athlete's emotions associated with return-to-sport, the goals expressed by athletes when trying to return-to-sport, and the perceived role that coaches play when the athlete is attempting to return-to-sport.

In their initial study, Podlog and Eklund (2006) identified themes for athletes underlining their desire to return-to-sport that have strong ties to the concept of intrinsic motivation within SDT (e.g., the love of the game, achieving personal goals, etc.). In addition, it was of highest importance to the athletes that their return-to-sport from injury be successful, for not only themselves but also their team (Podlog & Eklund, 2009). Interviews with coaches suggested that they are aware of the difficulties athletes encounter with returning to sport, as well as, highlighting how feelings of autonomy, relatedness, and competence may play integral roles in injury recovery. When an environment provides opportunities for athletes to fulfil each of these psychological needs (autonomy, relatedness, and competence), according to BPNT, it is proposed to support healthy functioning and promote optimal outcomes such as enhancing well-being (Ryan & Deci, 2002). Podlog and Eklund (2006; 2007; 2009) through this series of research, looking at returning to sport from an injury for athletes, were able to demonstrate that SDT can be used to understand athletes' experiences when returning to sport following injury and how different types of motives (and motivational processes such as feelings of psychological need satisfaction) can play prominent roles for injured athletes undergoing rehabilitation.

While the work spearheaded by Podlog and Eklund (2006; 2007; 2009) is informative about the utility of SDT as a framework for understanding recovery from sport injury, a few limitations are evident in their research that warrant further scrutiny.

One limitation evident in the work of Podlog and Eklund (2006, 2007, 2009) is lack of focus on how different people (i.e., coach, therapist, etc.) involved in sport may impact the rehabilitation process following injury. In the broader SDT literature this issue is not well-documented within the mini-theories comprising this approach to understanding human motivation in terms of articulating ‘how’ (or ‘if’) motivation can ‘spread’ (or be transmitted) from one person to another within and across contexts. Social contagion (Wild & Enzle, 2002) is an approach to understanding motivation (particularly intrinsic motivation) that accounts for the potential role that one person’s actions (or presence) can have in terms of impacting another person’s motivation for a given behaviour.

Social Contagion: What role do others play in motivating behaviour?

Social contagion is the spread of ideas, attitudes, or behaviour patterns in a group through imitation and conformity (also called ‘behavioural contagion’; Colman, 2014). Research exploring social contagion is based on the phenomenological aspect of SDT (Ryan & Deci, 2000) and the importance of construal processes as mediators of the relationship between social events and motivational orientations (Wild & Enzle, 2002). More specifically, social contagion is concerned with how personal and social cues about another person’s motives are perceived by others and shape the significance of social events, leading one to pursue (or deter from) these events (Wild & Enzle, 2002). According to proponents of the Social Contagion Model (SCM; Wild & Enzle, 2002), people can self-generate changes in intrinsic motivation on the basis of how they perceive other people to be engaging in activities, implying that motivational orientations can be contagious and ‘spread’ from person-to-person within or across.

Wild and Enzle (2002) developed the SCM to advance the study of dyadic relationships that exist between cultural stakeholders (e.g., parents, managers, teachers, etc.) and individuals (e.g., children, subordinates, students, etc.) in the process of acculturation. Within the SCM, Wild and Enzle (2002), note that perceptions of others' motivation can influence (and alter) expectancy formations by changing the expected quality of task involvement, as well as, the expected quality of interpersonal relations, which in turn can change the perceiver's overall motivational orientation for undertaking the behaviour (or task).

Social Contagion: A brief historical overview

Some of the earliest work on contagion (defined as an event in which recipients behaviour has changed to become 'more like' that of the actor or initiator; Levy & Nail, 1993) can be traced to the mid-1900's. For example, Polansky, Lippitt, and Redl (1950) reported differences in effective influence attributed to prestige and specific attributes (e.g., good looks, good athlete, etc.). Grosser, Polansky, and Leppitt (1951) found that perceptions of consequences could be altered by the behaviour of a collaborator. Lippett, Polansky, and Rosen (1952) found that high-prestige attributes were more effective for contagion, meaning low power members were more easily influenced, and high power members were found to be better models for contagion and able to resist direct influence attempts more frequently.

Following this early work on social contagion, additional studies attempted to differentiate contagion from other psychological constructs. For example, Wheeler (1966) distinguished between contagion and conformity by the part each psychological construct plays in conflict. According to Wheeler (1966), people experiencing contagion

experience conflict before the presence of others, whereas in conformity, the conflict is produced within the person due to the presence of others and their external judgments. Social facilitation, another type of social influence, is separated from these constructs by its lack of any conflict altogether (Wheeler, 1966).

In later work, Freedman (1982) argued that conformists are usually seen in larger groups or 'populations' whereas contagion is often seen within a small number of the majority; only one person or a small group perform the action. Under the banner of intensification theory (increased density causing actions to become more salient), Freedman and Perlick (1978) demonstrated that smiles and laughter differed across groups varying in size with high-density groups reporting higher levels of behavioural contagion.

Within SCM proposed by Wild and Enzle (2002), key differences are evident with other models or theories that have studied contagion (or related constructs). Specifically, Wild and Enzle (2002) emphasize that the key difference between SCM and other models (or theories of social influence) is that people are self-generating expectations in response to initial cues about one's motivation. Perceiving another person's motives towards an activity elicits a cognitive set that initiates this 'self-generating' source of influence thereby changing the intrinsic motivation of a person towards a target activity. Although imitation and conformity could be plausible explanations for the change of behaviours, Wild and Enzle (2002) contend that the evidence base generated by testing facets of SCM sufficiently differentiates contagion in their approach from unacknowledged sources of contextual interpersonal influence on intrinsic motivation.

When social contagion is present, it is one's interpretation of the context of the activity of engagement (perceiving another's motives as extrinsic or intrinsic; Wild & Enzle, 2002), and not one imitating or modeling another's behaviour (Bandura, 1977). As imitation requires a target to behave in an extrinsically or intrinsically manner, where in social contagion, it is the self-generating changes in motivation based on initial cues about a target's motivation and not how the target behaves (Wild & Enzle, 2002).

SCM: What do we know already?

Wild and colleagues have been at the forefront of research developing the phenomena of social contagion and the SCM most often cited in line with SDT (e.g., Wild, Enzle, & Hawkins, 1992; Wild, Enzle, Nic & Deci, 1997; Wild, Cunningham, & Hobdon, 1998). Drawing from the SCM, and the broader tenets of SDT (Deci & Ryan, 2002), Wild and colleagues have developed this approach from a series of investigations examining student-teacher interactions, as well as, therapist-client interactions that are summarized in brief to provide context for this study.

The first study completed on social contagion by Wild et al. (1992) examined teacher-student interactions. In this study, a teacher was portrayed as providing lessons on a piano to students for either intrinsic or extrinsic reasons. Using a sample of undergraduate psychology students without previous musical training, an experimental protocol was used whereby participants were assigned to either a paid teaching condition (extrinsic motivation) or a volunteer teaching condition (intrinsic motivation). After the lesson, students were given a questionnaire to assess their levels of enjoyment and interest in the learning experience, perception of the teaching, plus their overall mood after the lesson. The students rated paid teacher's general interest as lower, as well as,

their desire to teach as lower. The volunteer teacher was rated higher in innovativeness and being spontaneous during the lesson, and the students in the volunteer condition also believed their teacher enjoyed instructing the student within the lesson to a greater extent. Wild et al. (1992) claimed these findings support the hypothesis that the students (or learners) perceptions can change their own motivation, providing support for the idea of social contagion, as the knowledge of the presence (or absence) of extrinsic controls influenced the student's own interest in the process and overall outcome.

The second study conducted by Wild and colleagues used two separate investigations to address the issue of social contagion. The first study examined expectancy formation following perceived motivation of an interpersonal target (Wild et al., 1997). Using introductory psychology students with two separately prepared fictional vignettes (with six versions of each vignette describing a targets' motivation), Wild et al. (1997) reported that in the volunteer condition, providing disconfirming information had the lowest expectancy task enjoyment value, whereas in the paid condition, disconfirming information led to the highest expectancy task enjoyment value. Furthermore, opposing effects on expected learner enjoyment were found between conditions. According to Wild et al. (1997), these results further support the role of another person's motivation in terms of the potential influence (or change) of this process that can impact the perceiver's expectations.

The second investigation reported by Wild et al. (1997) used a different task to Wild et al. (1992) in an attempt to rule out extraneous variables that could explain the effects of perception. Undergraduate psychology students participated in this study; a confederate (serving as an instructor) taught the students a magic trick. To extend this

study beyond mere replication, Wild et al. (1997) asked the student to teach the magic trick they learned to a 'second generation learner' (i.e., another person) to see if the type of motivation would be perceived and extend beyond the first lesson. Wild et al. (1997) reported that learners in the volunteer condition indicated greater interest in further learning, and enjoyed performing the magic trick more than in the paid condition. These results extended to 'second generations learners'; those who were taught by a student who was previously taught in the volunteer condition, who also showed greater interest and enjoyment. This study demonstrates that the idea of social contagion is relevant in different settings or contexts, and can continue beyond perceptions of 'first generation learners' to others within a person's social network. Furthermore, the results of this study imply that social contagion of motives toward learning can affect new students' serial teaching and learning episodes (Wild et al., 1997). This study was able to show that not only the motivation of the teacher can affect the interest and task enjoyment for one student, but may also spread from student-to-student within learning environments.

The final study in this series conducted by Wild and colleagues extended the work on social contagion to a clinical setting by examining clients entering alcohol treatment, as well as, considering the impact of formal and informal pressures on behaviour and expectations (Wild et al., 1998). Participants were enrolled in a randomized experimental design where they read one of six vignettes then completed questionnaires measuring expected interest of treatment for the client, and expected level of behaviour change following client's treatment. Overall, the results of Wild et al. (1998) demonstrated that treatment was thought to be most effective when both the clients entering the treatment, and the counselors providing the treatment were classified as being intrinsically

motivated. Wild et al. (1998) also reported that people who believed that therapists were intrinsically motivated for providing treatment could reverse the expected negative consequences associated with compulsory treatment and impression management for clients entering treatment for alcohol addiction. Based on the therapists' motives, expectancies (or expectancy formations) of the clients entering treatment who were extrinsically motivated were rated higher in interest and behaviour change with a therapist who was intrinsically motivated (Wild et al., 1998).

SCM: What evidence of social contagion exists in sport and exercise research?

There has been very little research examining social contagion in either sport or exercise settings in comparison to the amount of research focused on other aspects of the SDT framework (Deci & Ryan, 2002). One recent study published by Scarapicchia, Sabiston, Anderson, and Bengoechea (2013) examined the effects of social contagion in an exercise setting by comparing extrinsic and intrinsic verbal cues provided during exercise on motivation and physical activity behaviour. This study tested for social contagion effects in female university students. Using a randomized experimental design, Scarapicchia et al. (2013) divided the sample into two groups; one which received extrinsic verbal cues, while the second group received intrinsic verbal cues, when exercising on a treadmill next to a confederate providing the verbal cues. Participants walked or ran while listening to either extrinsically or intrinsically motivated cues and the amount of time spent exercising after the cues were delivered was measured and recorded. Scarapicchia et al. (2013) reported that heart rate, perceived exercise intensity, duration of moderate-to-vigorous exercise, and continuance intentions were higher for the group receiving intrinsic cues compared to the group who received extrinsic cues.

According to Scarapicchia et al. (2013), these findings imply that exercise motivation can be contagious as a function of priming via the provision of verbal cues.

Consistent with the research evidence in the exercise psychology literature, few sport psychology researchers have systematically examined the potential role of social contagion in competitive athletes. Two studies have focused their research efforts on the role of social contagion that are worthy of note. In the first study, Moll and colleagues used video images of soccer penalty shootouts held in elite-level competitions (i.e., World Cup matches) between 1974 and 2006, to determine levels of emotional contagion from celebratory responses (Moll, Jordett, & Pepping, 2010). Behaviours following penalty shots were coded for overt responses and/or actions (e.g., raising arms, puffing chest, facial expressions, etc.). Moll et al. (2010) found that both arms extended out from the body (below head-height) or raised above the head were associated with the final result and could predict the outcome of the next penalty on the opponent's team. In brief, Moll et al. (2010) reported that pride was linked with winning the penalty shootout implying that the display of pride, when perceived by fellow teammates, increases self-esteem and dominance. According to Moll et al. (2010), this increase in pride directly enhances future performance in penalty shootout competitions.

A subsequent study by Boss and Kleinhart (2015) found that a sudden decline in a partner's performance may also be contagious to others. Male and female sport science students, who were athletes at the time of the study, were used in a controlled laboratory experiment. Partners were given a balancing task to perform, and asked to generate team goals in order to give feedback regarding their partner's performance. After manipulation (changing the partner's performance to a negative outcome), participants estimated the

overall competence of the partner to be lower. The team duos that had more perceptions of errors in their partner found that these errors can be contagious in a given task.

Justification for the Present Study

Social contagion is the spread of ideas, attitudes and behaviours from person-to-person. Overall, the research spearheaded by Wild and colleagues has provided greater understanding of social contagion as a phenomena of interest in social psychology, as well as, provided a platform for further exploration of social contagion processes within the SCM in applied contexts such as substance abuse therapy (Wild et al., 1998). The net effect of these studies by Wild and colleagues is that the SCM could promote a greater understanding of processes that effect intrinsic motivation based on the role afforded by interpersonal dynamics (e.g., coach-athlete, athletic therapist-athlete, etc.). Considering the limited research examining facets of the SCM within sport, it is proposed that replication and extension of the work of Wild et al. (1998) in the area of sport psychology research is a worthwhile initial step in advancing the study of social contagion in sport psychology research, as well as, complementing the available evidence attesting to the phenomena of contagion in sport (e.g., Boss & Kleinhart, 2015; Moll et al., 2010).

The first line of reasoning justifying this study concerns the importance of replication in the process of accumulating knowledge via science (Schmidt, 2009). The present study replicates and extends previous work done by Wild et al. (1998) using an approach labeled 'conceptual replication' (Schmidt, 2009). Schmidt (2009) defines conceptual replication as a test of a hypothesis or a result from earlier research using different methods from those reported in a previous study. Replication is an important part of research, as it provides evidence that the events occurring are not isolated

incidents, which all too often occur as a function of coincidence, but are regular occurrences that can be reproduced and empirically verified (Schmidt, 2009). This study replicated previous work by using the same methods (fictional narratives and questionnaires) developed by Wild et al. (1998) in a different context from the original work (i.e., sports injury recovery versus substance abuse therapy). This initial extension of previous work concerning the SCM seeks to test ideas generated from Wild and Enzle's (2002) arguments in a new context (i.e., sport injury recovery) rather than focusing on recovery from alcohol addiction as reported by Wild et al. (1998).

The rationale for both the design and recruitment of participants (who did not need any prior athletic experiences or injury history) for the current study is based on the replication of Wild et al. (1998), who used a 3 x 2 between subjects experimental design, with a randomized sample recruited from visitors to an Ontario Science Centre. Of the 116 participants in this study, 39 were male and 75 were female. Only 6% of participants used in the Wild et al. (1998) study reported ever seeking help for an alcohol problem. Construction of dependent variables as well as, the independent variables (i.e., vignettes) and manipulation item questions were adapted exclusively from Wild et al. (1998). Questions used by Wild et al. (1998) that referred to the 'client' entering treatment were changed to the 'athlete'. Questions used by Wild et al. (1998) that referred to the 'therapist' were altered to 'athletic therapist'. Lastly, questions used by Wild et al. (1998) that referred to the 'judge' were changed to the 'coach'. For the main effects on both perceived client motivation and perceived therapist motivation, Wild et al. (1998) ran multiple Analysis of Variances in order to attempt to protect against type 1 errors, however, the current study, two separate Multivariate Analysis of Variance were used to

examine the effects of the different types of motivation in each vignette (independent variables) on the dependent variables of interest (e.g., Perceived Athlete Interest in Therapy).

The second argument justifying this study concerns the focus of previous social contagion research within sport. Specifically, previous studies have examined contagion effects on performance behaviour (e.g., Boss & Kleinhart, 2005) and emotions (e.g., Moll et al., 2010) but have not yet focused any research attention on recovery from injury and/or the various motivational processes that could impact this aspect of sport. Given the prevalence of injury rates in sport at all levels of competition (e.g., Caine et al., 2013; Tolbert et al., 2011), it would appear prudent to understand psychological factors that can facilitate (or forestall) recovery from a sport-related injury. Based on the work of Wild et al. (1998), it seems reasonable to contend that motivation of the athlete, therapist, or both, may play a pivotal role in recovery from injury by athletes, yet this remains speculative at present without empirical data to support such a claim within sport.

Study Purpose

The purpose of this study is to understand the role of motives held by the athletes, athletic therapists and coaches in the process of injury recovery treatment within sport. This research project also replicated and extended previous work done by Wild et al. (1998). More specifically, this study aims to determine whether the perception of the motivation of both the athlete and the athletic therapist impacts the perceived expectancies, efficacy, and overall outcome of the therapy designed for recovering from sports injuries. Furthermore, this study examined how pressure from the coach may also

impact the perceived expectancies, efficacy, and overall outcome of the athlete in recovery therapy.

Research Questions and Study Hypotheses

To address the study purpose, the following questions were examined in this research: (1) How does the perceived motivation of the athlete and athletic therapist impact perceived expectancies about, and recovery from, a sports injury? (2) Does pressure from the coach also impact perceived expectancies about, and recovery from, a sports injury?

To address the first question, it was hypothesized that there would be a difference in the perceived effectiveness of recovery therapy when athletes and therapists are both intrinsically motivated, relative to when both are perceived as displaying extrinsic motivation. This hypothesis is derived from previous research on social contagion based on the findings of Wild et al. (1998) where clients who were perceived as freely choosing to enter treatment and therapists who were perceived as genuinely interested in counseling enhanced treatment efficacy. It is expected that the most effective levels of perceived behavioural change, perceived athlete interest in treatment, and the perceived effectiveness of the therapist will be seen when both athlete and therapist are intrinsically motivated for treatment.

For the second question, it was hypothesized that recovery treatment would be least effective, in terms of perceived athletes expectations of the effects of therapy based on a therapist who displays extrinsic motivation, as well as, experiencing social pressure of the coach (controlled impression management). This hypothesis is based on previous research reported by Wild et al. (1998) who indicated that the lowest levels of expected

treatment efficacy were observed when clients entered treatment only to manage impressions and when the assigned therapist exhibited extrinsic motivation.

Different types of extrinsic motivation for entering rehabilitation therapy and how these types of motivation could possibly exhibit different effects were also examined. Based on previous work by Wild et al. (1998) who thought that participants would believe intrinsically motivated therapists could reverse negative effects on expectations about the treatment process and outcome for clients entering treatment under court order or because of impression management concerns. It was hypothesized for this study that for athletes entering rehabilitation treatment under coach's order or to create a good impression on the coach, therapists would be able to reverse these negative effects on perceived expectations about the treatment process and overall outcomes. These predictions follow the findings of Wild et al. (1997), that expectancy formation can be changed based on different construal's of a targets motivation that a person perceives.

While these hypotheses are based on relevant theory (i.e., SDT; Deci & Ryan, 2002) and previous social contagion research (i.e., SCM; Wild & Enzle, 2002; Wild et al., 1997; 1998), they are considered speculative at best in this study. This speculation is based on the observations of research by Wild et al. (1998) who studied social contagion within a therapeutic context focused on substance abuse and addictions treatment and not competitive sport. It remains unclear if the social contagion processes identified and empirically supported by Wild et al. (1998) operate in sport in the same way as noted in addictions therapy research focused on recovery from excessive alcohol consumption. Nevertheless, arguments derived from SDT (Deci & Ryan, 2002), plus the SCM work

reported by Wild and colleagues (e.g., Wild & Enzle, 2002) to date, provide initial support for the aforementioned hypotheses to be tested in this study.

Methods

Participants

The sample for this study was comprised of 145 university students. A non-probability based (purposive) approach to sampling was used in this study (Trochim, 2006). The inclusion/exclusion criteria used for recruitment of participants in this study were as follows: (a) Aged 17 years (or older) at the time of data collection, (b) Able to read and write in the English language, and (c) Willing to consent to participate in the study.

Instrumentation

The full range of items included in the questionnaire and in this study are presented in Appendix A.

Demographics. Descriptive information for the sample was obtained through self-report questions pertaining to age, sex, and previous athletic injury history and overall sport experience based on items used in previous sport-injury research (e.g., Podlog & Eklund, 2010).

Manipulation Check. Four questions were used as a manipulation check in order to determine if the independent variables had their intended effects on the dependent variables in this study. These items appeared at the beginning of the study questionnaire, and were derived from Wild et al. (1998). Each of the 4 items was rated on a 7-point Likert-scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A sample

manipulation check item is as follows: “Chris is going to treatment because he really wants to.”

Follow Up Questions. A total of 33 items (including the manipulation check items) were adapted from Wild et al. (1998) to use as the dependent variables in this study. These items measured (1) perceived athlete’s interest in treatment, (2) extent to which perceived behaviour changes would occur as a function of treatment, (3) degree to which the therapist was perceived as interested in treating athletes with injuries, and (4) the perceived efficacy of the therapist in helping the athlete to change their behaviour. Participants were asked to answer these questions on a 7-point Likert-scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A sample item assessing one of the dependent variables measure in this study is as follows: “Chris is interested in athletic therapy for recovering from injury.”

Research Design and Data Collection Procedures

Research Design

This study used a multiple groups; post-test only, randomized experimental design (Trochim, 2006). Data were collected from participants on a single occasion only, with no repeat assessments.

Data Collection Procedures

The participants were recruited from Brock University using recruitment posters (see Appendix C) distributed around campus, and verbal presentations (see Appendix D) made to undergraduate kinesiology classes ($n = 2$). A study website was also available to attract potential participants (projectmotar.weebly.com) detailing further information about the purpose of the study and the participation requirements. All participants

received a Letter of Invitation (see Appendix G) in this phase, prior to giving informed consent to proceed to data collection for this study.

After initial contact was made with potential participants, the following procedure was invoked:

1. Potential participant arrived at the Behavioural Health Science Research Lab in Welch Hall Room 141 where they were greeted by the principal student investigator (Sarah Deck)
2. Potential participant was brought into the annex room within the lab, which has a table, two chairs, and a computer desk with a computer
3. Potential participant was asked to sit down at the table, while the principal student investigator closed the door to ensure privacy
4. The student investigator explained the purpose of the study, why it is important, any potential risks and benefits, and what the potential participant would be asked to do if they consented to enrol in the study
5. The potential participant was asked if there are any questions and if they wish to continue to complete the study
6. If they wished to complete the study, the potential participant was asked to check a box that ensured informed consent (the form in Appendix I) given by the student principle investigator in person on paper
7. The informed consent form was secured in a separate file folder and put away in a locked file cabinet
8. The participant was then asked to move to the computer where the study questionnaire was set up and ready for them to access

9. The participant was handed a printed copy of one of six narratives to read before they completed the questionnaire (see Appendix B)
10. The principal student investigator left the room to give the participant privacy, but ensured the participant if they needed anything (or wished to stop), they could contact the principal student investigator in the adjacent room within Welch 141
11. Once the participant read the narrative, they were instructed to begin answering questions pertaining to the narrative, as well as, questions regarding demographics on the computer
12. The questions were done on a secure website (www.surveymonkey.com) and took most participants 25-30 minutes in total to complete, including reading the narrative
13. Once the participant completed the questions, the principal student investigator explained the potential summary feedback they could receive
14. The participant was asked if they wish to receive the summary feedback, and if so, the student investigator asked for a way to contact with the feedback (e.g., email)
15. The student investigator put the participant debriefing form (see Appendix I) in a separate file folder than the informed consent, and locked this folder in a file cabinet
16. The participant was thanked for their contribution to the study and shown out of the Behavioural Health Science Research Lab

Data Analyses

Preliminary data analysis involved examining the data for missing values and determining that assumptions of statistical tests were met. Missing values were screened for and replaced using an expectation maximization (EM) algorithm (Tabachnick & Fidell, 2001). When there is a small amount of missing data and these scores are determined to be missing at random, EM is the most reasonable approach that provides a less biased imputed score for use in subsequent analyses (Tabachnick & Fidell, 2001). The following assumptions were evaluated: (a) independence of observations, (b) missing values, (c) multivariate normality, (d) multivariate outliers, (e) linearity, (f) homogeneity, (g) equal cell sizes, and (h) multicollinearity (Tabachnick & Fidell, 2007). Cronbach's alpha (Cronbach, 1951) was used as an estimate of score reliability for each dependent variable: (a) Athlete Interest, (b) Positive Behaviour Change, (c) Therapist Interest, and (d) Therapist Efficacy.

The main analysis was conducted using two separate multivariate analyses of variance (MANOVA) and two separate analyses of variance (ANOVA). Each MANOVA was used to examine mean differences among groups on multiple dependent variables (Tabachnick & Fidell, 2001). In this study, each narrative was the independent variable, or grouping variable, for the first and second MANOVA. Mean differences between the grouping variable and dependent variables of perceived Athlete Interest and perceived Positive Behaviour Change were examined in the first MANOVA. The second MANOVA examined mean differences between the grouping variable and the dependent variables of perceived Therapist Interest and perceived Therapist Efficacy. Separate ANOVAs were then used to examine mean differences between the grouping variable and each separate dependent variable.

Results

Data Analysis: Screening for and Replacing Missing Data

Data were screened for missing values, and 11 participants were found to have provided no data, on any items (demographics and all dependent variables). These participants were classified a ‘non-respondent’ and removed from the data set before any further analyses were undertaken. There were 2 participants who gave partial data (demographics and response to some of the follow-up questions). Little’s (1988) Missing Completely at Random (MCAR) was computed and found to be non-significant ($\chi^2 = 25.18$, $df = 18$, $p = .12$) suggesting that the data could be classified as missing completely at random. These missing values were replaced with imputed values using an Expectation Maximization Algorithm (EMA) in IBM® SPSS® Version 22.

Participant Characteristics

Of the 145 participants ($M_{\text{age}} = 20.0$ years; $SD_{\text{age}} = 2.0$ years; Range = 15.0), the majority were female (59.0%), single (97.0%), held a high school diploma (81.0%), described their ethnicity as Caucasian (37.0%), and worked part-time (52.0%) at the time of collection. Table 1 provides descriptive information obtained from the sample about the demographic items used in this study. The majority of this sample reported playing multiple sports (60.0%), a portion of the sample played two different sports (28.0%), with their main sport being at a representative level (40.0%). Table 2 provides the descriptive information obtained from the sample about their sports history. In this sample, most people experienced an injury causing absence from sports (71.0%) with the most common injury reported in this sample being a ligament tear (21.0%). More than half of the sample received therapy for their injury (64.0%) with the most common modality

being physical therapy (44.0%). Table 3 provides descriptive information obtained from the sample about sports injuries.

Reliability Estimates

Cronbach's α -values (Cronbach, 1951) were estimated for all dependent variables in this study and shown for each subscale in Table 5. Perceived Athlete Interest in Therapy ranged from 0.50 to 0.75, with a $M_\alpha = 0.66$ ($SD_\alpha = 0.10$). Perceived Positive Behaviour change values ranged from 0.66 to 0.85 with a $M_\alpha = 0.75$ ($SD_\alpha = 0.07$). Perceived Therapist Interest values ranged from 0.48 to 0.86 with a $M_\alpha = 0.71$ ($SD_\alpha = 0.16$). Perceived Therapist Efficacy values ranged from 0.56 to 0.76 with a $M_\alpha = .66$ ($SD_\alpha = 0.78$). Individual items per dependent variable were evaluated for potential causes of low score reliability in all subscales except perceived Positive Behaviour Change. Further analysis showed that removal of any of the individual items would not improve the score reliability of any of the subscales therefore no items were dropped prior to conducting any subsequent analyses.

Manipulation Check

To ensure that the manipulation had its intended effect for the intrinsic motivation of Chris (the athlete), the following item was used: "Chris is going to treatment because he really wants to." A one-way ANOVA was performed ($F(5,139) = 107.76, p < .01$). Narrative 1 ($M = 6.64, SD = .86$) and Narrative 4 ($M = 6.70, SD = .64$) where Chris is portrayed as intrinsically motivated scored higher than Narrative 2 ($M = 2.12, SD = 1.37$), Narrative 3 ($M = 2.21, SD = 1.18$), Narrative 5 ($M = 1.88, SD = .88$), and Narrative 6 ($M = 2.58, SD = 1.41$) in which Chris is described being extrinsically motivated.

To ensure that the manipulation had its intended effect for the extrinsic motivation

of Chris (the athlete), the following item was used: “Chris is going to treatment because he feels pressure to.” A one-way ANOVA was performed ($F(5,139) = 70.12, p < .01$). Narrative 2 ($M = 5.96, SD = 0.91$), Narrative 3 ($M = 5.88, SD = 1.19$), Narrative 5 ($M = 5.72, SD = 1.06$), and Narrative 6 ($M = 5.37, SD = 1.10$) displaying Chris as extrinsically motivated were higher than Narrative 1 ($M = 2.00, SD = 1.08$) and Narrative 4 ($M = 2.04, SD = 1.40$), which portrayed Chris as intrinsically motivated.

To ensure that the manipulation had its intended effect for the extrinsic motivation of the therapist, the following item was used: “The therapist is treating Chris because of the money she earns.” A one-way ANOVA was performed ($F(5,139) = 43.22, p < .01$). Narrative 2 ($M = 4.50, SD = 1.89$), Narrative 3 ($M = 5.00, SD = 1.62$), and Narrative 4 ($M = 4.79, SD = 1.82$), displaying the therapist as extrinsically motivated were higher than Narrative 1 ($M = 1.76, SD = .93$), Narrative 5 ($M = 1.36, SD = .50$), and Narrative 6 ($M = 1.30, SD = .75$), which portrayed the therapist as intrinsically motivated.

To ensure that the manipulation had its intended effect for the intrinsic motivation of the therapist, the following item was used: “The therapist is treating Chris because she is genuinely interested in helping.” A one-way ANOVA was performed ($F(5,139) = 27.84, p < .01$). Narrative 1 ($M = 6.48, SD = .59$), Narrative 5 ($M = 6.36, SD = 1.32$), and Narrative 6 ($M = 6.71, SD = .62$) displaying the therapist as intrinsically motivated were higher than Narrative 2 ($M = 4.29, SD = 1.65$), Narrative 3 ($M = 4.04, SD = 1.23$), and Narrative 4 ($M = 3.70, SD = 1.85$), which portrayed the therapist as extrinsically motivated.

Main Analyses: Effects of Social Contagion on Dependent Variables

Prior to conducting the MANOVA's, the following statistical assumptions were evaluated: (a) independence of observations was met via the procedural technique of random assignment to conditions, (b) missing values were screened for and removed prior to analyses, (c) multivariate normality test is robust when there is at least 20 cases in the smallest cell which is a condition met in this study, (d) Mahalanobis distance was used to screen for multivariate outliers; no multivariate outliers were found in either MANOVA, (e) linearity was evaluated by inspection of bivariate scatterplots and determined to be plausible in this data set, (f) Box's *M* test for homogeneity of dispersion matrices were significant ($p < .01$) for both MANOVAs, suggesting use of a more robust multivariate test statistic in this study along with caution when interpreting the results, (g) equal cell sizes were determined by randomization of participants into each of the six conditions, and (h) SPSS protects against multicollinearity and singularity through computation of pooled within-cell tolerance for dependent variables; dependent variables with insufficient tolerance are deleted from the analysis (Tabachnick & Fidell, 2007). Perceived Positive Behaviour Change and perceived Athlete Interest were correlated ($r_{12} = .56$). Perceived Therapist Interest and perceived Therapist Efficacy were correlated ($r_{12} = .78$).

A MANOVA was performed using the 6 narratives as independent variables, and perceived Athlete Interest and perceived Positive Behaviour Change as dependent variables. Bray and Maxwell (1985) suggested when data are normally distributed across the experimental conditions that Pillia-Bartlett trace is the most robust multivariate test statistic to violation of assumptions. Therefore, with the use of Pillia's Trace criterion, both perceived Positive Behaviour Change and perceived Athlete Interest were

significantly effected by the types of motivation in each narrative, ($F(10, 278) = 17.68, p < .01$); partial $\eta^2 = 0.39$). Follow-up Analyses of Variance were performed for both perceived Athlete Interest ($F(5,139) = 52.3, p < .01$; partial $\eta^2 = 0.65$, and perceived Positive Behaviour Change ($F(5,139) = 8.27, p < .01$), partial $\eta^2 = 0.23$). Descriptive statistics revealed that for perceived Athlete Interest, Narrative 1 and Narrative 4, where the athlete was described as intrinsically motivated were significantly higher than Narratives 2, 3, 5, and 6 where the athlete was described as extrinsically motivated and/or subject to impression management. For perceived Positive Behaviour Change, there were significant differences between Narratives 1 and Narrative 4 (athlete described as intrinsically motivated) compared to Narratives 3 and 6 (both extrinsically motivated and impression management scenarios), as well as Narrative 5 (athlete is extrinsically motivated and the therapist is intrinsically motivated). Narrative 2 where the athlete and the therapist are both extrinsically motivated revealed no significant differences when compared to the other scenarios. Table 4 provides the mean scores for each narrative.

A MANOVA was performed using the 6 narratives as independent variables, and perceived Therapist Interest and perceived Therapist Efficacy as dependent variables. With the use of Pillia's Trace criterion, both perceived Therapist Efficacy and perceived Therapist Interest were significantly affected by the types of motivation in each narrative, ($F(10, 276) = 7.83, p < .01$; partial $\eta^2 = .22$). Follow-up Analysis of Variance were performed for both perceived Therapist Interest ($F(5,139)=15.27, p < .01$; partial $\eta^2=0.35$), and perceived Therapist Efficacy ($F(5,139)=5.92, p = .01$; partial $\eta^2 = .018$). Descriptive statistics (see Table 4) revealed that for perceived Therapist Interest; Narrative 1, Narrative 5 and Narrative 6, where the therapist was described as

intrinsically motivated were higher than Narratives 2, 3, and 4, where the therapist was described as extrinsically motivated. For perceived Therapist Efficacy, Narrative 1 where the therapist was described as intrinsically motivated was significantly different from Narrative 2 and Narrative 3 where the therapist was extrinsically motivated. There were no differences observed in Narratives 4, 5, and 6.

Discussion

Social contagion provides an explanation of how interpersonal cues shape processes and can mediate the relationship between social events and motivational orientations (Wild & Enzle, 2002). This study replicated previous work by Wild et al., (1998) and adds to the social contagion literature exploring issues germane to sport. The main purpose was to understand the role of social contagion in the motivation of athletes, athletic therapists and coaches in the process of injury recovery treatment, and how motivational orientations might spread from person to person. It was hypothesized that there would be a difference in the perceived effectiveness of recovery therapy when athletes and therapists are both intrinsically motivated, compared to when both are displaying extrinsic motivation. It was anticipated that recovery treatment would be perceived as least effective, in terms of athlete's expectations of the effects of therapy, when being treated by a therapist who displays extrinsic motivation, as well as, experiencing social pressure from the coach. In addition, it was hypothesized that an intrinsically motivated therapist could reverse the negative effects on perceived expectations about the treatment process and outcomes for an athlete entering rehabilitation therapy under coach's orders or because of impression management concerns.

Using a randomized experimental design with a non-probability based approach to sampling, a total of 145 participants recruited from a single university located in Southern Ontario provided data for this study. Results were similar to those of Wild et al. (1998) and generally supported the study hypotheses. For both perceived Interest in Athletic Therapy and perceived Positive Behaviour Change, the narratives where the athlete was described as intrinsically motivated yielded higher scores compared to narratives displaying an extrinsically motivated athlete. Supporting social contagion, when the therapist was described as intrinsically motivated, and the athlete was described as extrinsically motivated, scores for perceived Positive Behaviour Change were still higher than when both were described as extrinsically motivated, partially supporting the third hypothesis that beliefs (or expectancy formation) is malleable to a degree depending on differential construal's of an interpersonal target's motivation (Wild et al., 1998). Perceived Therapist Efficacy differed when both the athlete and the therapist were described as intrinsically motivated compared to when they were both described as extrinsically motivated and when the athlete felt pressure to enter therapy from the coach. Interestingly, there was no significant difference in perceived Therapist Efficacy when the therapist was intrinsically motivated but the athlete was extrinsically motivated or pressured into therapy by the coach. Overall, these findings indicated the athlete's motivation might play a larger role in the perceived efficacy of therapy in sport than the therapist's motivation does, insinuating that the therapist's motivational orientations did not spread to the athlete to effect perceived Athlete Interest, but may play a role for athletes in terms of perceived Positive Behaviour Change during injury recovery therapy.

Score Reliability: Issues in the Measurement of the Dependent Variables

Coefficient alpha is useful for estimating reliability when item-specific variance in a uni-dimensional test is the focal point of interest (Cortina, 1993). If a test has a large alpha, then it can be concluded that a large portion of the variance in the test is attributable to general and group factors (Cortina, 1993). Coefficient α -values (Cronbach, 1951) were estimated for each dependent variable (perceived Athlete Interest, perceived Positive Behaviour Change, perceived Therapist Interest, and perceived Therapist Efficacy). These numbers ranged from 0.48 to 0.86 (Table 5) across experimental conditions in the sample providing data for this study. Evaluation at the item-level for the assessments made in each experimental condition proved unsuccessful in terms of identifying candidate items for deletion given that item deletion would not yield higher coefficient values in this sample. Due to these low reliability scores, interpretation of the study data must be taken with caution because low reliability can infuse results with aversive effects even in experimental research (Crocker & Algina, 1986).

Wild et al. (1998) reported much higher coefficient alpha values for scores measuring the same dependent variables used in this study. The following score reliability values were reported by Wild et al. (1998): perceived Athlete Interest ($\alpha = 0.83$), perceived Behaviour Change ($\alpha = 0.78$), perceived Therapist Interest ($\alpha = 0.84$), and perceived Therapist Efficacy ($\alpha = 0.65$). The difference in coefficient alpha scores between studies (or samples) could be attributed to construct bias or item bias (Van de Vijver & Hambleton, 1996). Construct bias is attributed to both differences in conceptualization and in behaviours associated with the focal construct of interest. Construct bias is more likely to occur when an existing instrument is translated which is

the likely explanation for the results in this study where items were adapted from the work of Wild et al. (1998). Item bias refers to instrument anomalies within an instrument usually at the item-level such as poor wording, inappropriateness of item content for use in select cultural groups, and inaccurate translations (Van de Vijver & Hambleton, 1996). This type of bias may account for the range of score reliability value observed across experimental conditions in this study. The low reliability of scores could be attributed to one (or both) of these aforementioned biases. Stated differently, the use of these items may work well for research focused on alcohol recovery targeting clients and therapists, but not be effective for measuring these variables for injury recovery therapy targeting athletes and athletic therapists.

Main Effects of Athlete Interest in Therapy

In this study, there was a significant difference found between narratives for perceived Athlete Interest in therapy. When an athlete was described as intrinsically motivated (narratives one and four), they showed higher means in terms of perceived athlete interest compared to when the athlete was described as extrinsically motivated. Consistent with the results of Wild et al. (1998), maximal treatment efficacy was expected when both the therapist and client were intrinsically motivated. For perceived Athlete Interest, expectancy formation effects were unable to be reversed when an athlete was originally described as extrinsically motivated, while the therapist was described as intrinsically motivated. This implies that the therapist could not reverse the negative effects of compulsory treatment and impression management on perceived Athlete Interest. The effects of social contagion on motivation from therapist to athlete were not found on perceived Athlete Interest in therapy, but did confirm that just consistent with

the addict-counselor relationship (Wild et al., 1998), the belief that social controls (being forced into therapy by the coach) may show temporary fulfillment or compliance.

Unfortunately, due to the circumstances as to why the athlete is in therapy, there seem to be no long lasting effects or change in the athlete's interest or behaviour over time.

Main Effects of Positive Behaviour Change

In this study, there was a significant difference found between experimental conditions focusing on the dependent variable of perceived Positive Behaviour Change. Similar to perceived Athlete Interest, when an athlete was described as intrinsically motivated, mean scores were higher for perceived Positive Behaviour Change (narratives one and four). Interestingly, when an athlete was described as extrinsically motivated with no pressure from the coach and the therapist was intrinsically motivated, mean scores were also higher for perceived Positive Behaviour Change. Consistent with Wild et al. (1998), this result shows a possible link between perceptions of others' motives and expectancy formation. For Positive Behaviour Change only; expectancy formation effects may be reversible when information that disconfirms a target's motives is perceived. In this study, this finding implies that a therapist's motivation seems to be able to reverse the effects of the athlete's extrinsic motivation on perceived Positive Behaviour Change when there is no social pressure from the coach (impression management). Therapist motivation is perceived to generate changes in motivation in terms of Positive Behaviour Change on behalf of the athlete, implying support for the effects of social contagion from therapist to athlete. Research by Wild et al. (1998) implies that when behaviour change is successful, there is an increase attachment to the therapist coinciding with a shift from extrinsic motivation to intrinsic motivation. In real

interactions between sports/athletic therapists and athletes, these results give good reason to believe that how the athletic therapist's motivation is perceived by the athlete (interpretation of verbal cues), can help to change the behaviour of the athlete during injury recovery.

Main Effects of Therapist Interest

In this study, a significant difference was found between experimental conditions focusing on perceived Therapist Interest as the outcome variable. When an athletic therapist was described as intrinsically motivated (narratives one, five and six), mean scores were higher for perceived Therapist Interest compared to when the therapist was described as extrinsically motivated. This finding indicates the athletes motivational orientation did not seem to affect the motivational orientations and overall interest of the therapist providing treatment in the process of recovering from a sports-related injury. When athletes were freely choosing to enter therapy, with a therapist who was perceived as interested and genuinely wanting to help (or intrinsically motivated to engage), the highest scores were displayed across all dependent variables. These results are aligned with SDT research (Deci & Ryan, 2002), showing that higher levels of interest are often displayed within persons who are motivated for intrinsic reasons.

Main Effects of Therapist Efficacy

In this investigation, a significant difference was found between experimental conditions with reference to perceived Therapist Efficacy. Similar to perceived Therapist Interest, when a therapist was described as intrinsically motivated, the same narratives (one, five and six) had higher mean scores on the dependent variable labeled 'Therapist Efficacy' compared to an extrinsically described motivated therapist, regardless of

whether the athlete was intrinsically or extrinsically motivated or when there was social pressure from the coach. One interpretation of this observation is that the athletes' motivational orientation did not seem to affect the motivational orientations and efficacy of the therapist. These results are aligned with SDT research (Deci & Ryan, 2002), by showing that intrinsic motivation leads to the most positive consequences, and aligned with results of Wild et al. (1998), perceived motivation is an important factor of an individual's belief about the efficacy of recovery therapy. Therefore, in athlete-therapist interactions that occur within clinical settings focused on sports injury recovery, it is reasonable to believe that cues indicating the motivation of the therapist and the athlete can promote interest, efficacy and positive behaviour change towards successful injury recovery.

Limitations

There are at least six main limitations of this research that should be taken into consideration when interpreting the results. These limitation include, but are not limited to, the following: (1) Observed score reliability values; (2) Instrument adaptations; (3) Research design; (4) Recruitment procedures; (5) Sampling; and (6) The self-report nature of the data. Each of the aforementioned limitations will be examined with suggestions for future research to build upon the results reported in this study in sport injury and social contagion research.

In this study, the score reliability value for the items ranged from 0.48 to 0.85 in this sample. These numbers are less than ideal (Crocker & Algina, 1986) and represent a limitation of the data used in our study thereby urging caution when interpreting the results. The items used may not work well in the context of studying injury recovery

therapy for athletes. Future research should use more established instruments to measure the dependent variables (e.g., The Intrinsic Motivation Inventory, the Treatment Self-Regulation Questionnaire, etc.) that have greater likelihood of producing scores with less contamination from error when measuring similar dependent variables.

Using only the questions adapted from Wild et al. (1998) is the second major limitation of the study. The items used produced low reliability scores despite trying to find at the item-level any candidate for deletion. These low reliability scores can cause aversive effects in the results (Crocker & Algina, 1986). It may be best in future studies to use more established instruments (with higher reliability scores) to measure athlete interest in treatment, as well as therapist interest, or to develop a suitable instrument to assess these variables. When instruments are able to produce more ideal reliability scores, results can be interpreted with less chance that these results are contaminated with errors (Crocker & Algina, 1986). Greater heterogeneity across key variables (e.g., athletic injury, sports status, etc.) within the sample would likely impact the reliability of score for the dependent variables measured in this study and seems like a worthy direction for future research to consider when sampling.

The third limitation of this investigation concerns the research design used and the restriction of employing a post-test only design. When implemented correctly, randomized experimental designs can produce data with the strongest levels of internal validity, but just because an outcome occurs after a treatment does not mean that there is a causal relationship (Trochim, 2006). Despite internal validity being higher for randomized experimental designs, the artificial situations (vignettes read by participants) are more likely to limit the degree of external validity, restricting generalizing the

findings of this study to larger populations (Trochim, 2006). Post-test only designs do not allow for a baseline measurement for participants on the variables of interest within a study therefore do not permit the researcher to know if the dependent variables changed as a function of the intervention (Trochim, 2006). In the current study, use of a pre-post test design was not feasible as the purpose of the study was to determine if the perceived effects of Athlete Interest, Positive Behaviour Change, Therapist Interest, and Therapist Efficacy, after the participants read the vignette. Future research could use a group of currently injured athletes in order to take baseline measurements of their interest and motivation in athletic therapy to compare the final results to.

An additional limitation of this study concerns the nature of the sample and the sampling procedures used in this investigation. Based on a small effect and an alpha of 0.05, a target sample size of 1440 participants was targeted before data collection, while the overall sample size gathered for this study was 145 participants from a single university. Samples of college-educated individuals can be limiting, as they have elicited drastic differences in comparison to the other populations (Henrich, Heine, & Norenzayan, 2010). Without proper supportive empirical evidence, the results from this sample is not able to be generalized to all persons or athletes (Henrich et al., 2010). In this study, injury recovery was looked at with athletes, but our inclusion criteria for participating in the study did not include having to play a sport. Although the majority of participants currently or previously played sports, a future direction and extension of this study would be to recruit different types of athletes, such as, professional athletes, whose interest in returning to sport from an injury may be higher, as it is very likely that their salary and future careers are dependent on their return. It would also be beneficial to

future researchers to recruit from; (1) multiple universities to allow for more diversity; (2) multiple age groups to see differences across different age spans; and (3) athletes who have recently been injured and experienced therapy who may possibly be more able to relate to the given situation. Recruiting from a larger area, as well as using more (or different) methods of recruitment (e.g., social media) should help increase the overall sample size in future studies. Based on previous findings by Deal and Shields (2015), exploring the differences between the ‘type’ of therapist (e.g. Canadian Universities that use student athletic therapists) could show differences in the perceived efficacy of therapy based on this different type of relationship.

The final limitation was that the data that was collected was all self-report, and therefore requires participants to be truthful when providing data. Data depends on the respondent’s willingness and ability to provide information, and although multiple items make it easier to control for certain response styles such as acquiescence (respondents who tend to agree with statements without regard to their content) and extremity (uses the extreme choices on a rating scale; Robins, Fraley, & Krueger, 2007), it can still be seen as a weakness. Self-report data does have its advantages (i.e., richness of information and practicality), but can be hindered by time pressure and consistency of participant’s motivation. Internet surveys may introduce their own issues (Robins et al., 2007). During test construction, rational techniques can help to control for self-report data effects. These would prevent participants from responding in an undesirable fashion; for example, restricting item choice (Robins et al., 2007). Future research should use well-constructed self-report instruments that have been shown to predict outcomes with efficiency.

Summary

The purpose of this study is to understand the role of motivation of athletes, athletic therapists and coaches in the process of injury recovery treatment. More specifically, the study aimed to determine whether the motivation of both the athlete and the athletic therapist impacts the perceived expectancies, efficacy, and overall outcome of the recovery therapy. Furthermore, this study examined how pressure from the coach may also affect the perceived expectancies, efficacy, and overall outcome of the athlete in recovery therapy. Consistent with previous work (Wild et al., 1998) showing that motivation is an important factor for some people's belief about the perceived efficacy of treatment; when both an athlete and therapist were intrinsically motivated, there is a difference about overall perceived behaviour change and treatment efficacy compared to when both were described as extrinsically motivated. When an athlete is not interested (extrinsically motivated), motivation of the therapist did not seem to make a difference in perceived Athlete Interest in recovery therapy, but an intrinsically motivated therapist did seem to reverse effects of perceived Positive Behaviour Change for the extrinsically motivated athletes. These findings imply that motivational orientations of the therapist during injury recovery therapy cannot affect perceived Athlete Interest but are able to be transferred and affect expectancy formation for perceived Positive Behaviour Change. Overall, this implies that social contagion is not able to be used as a possible explanation for change in motivational orientations of athlete interest during recovery therapy, especially in impression management situations, but may be able to reverse the effects of an extrinsically motivated athlete in terms of perceived Positive Behaviour Change.

More work is warranted in finding a better way for measuring these motivational orientation changes.

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Table 1*Demographic Percentages*

Characteristic	Percent (<i>N</i> = 145)
Sex	
Male	41.0
Female	59.0
Marital Status	
Married/Common Law	3.0
Single	97.0
Highest Current Level of Education	
High School Diploma	81.0
University/College Degree	19.0
Employment Status	
Full-time Employed	3.0
Part-time Employed	52.0
Unemployed	45.0
Ethnicity	
Canadian	21.0
Indian	3.0
Caucasian	37.0
Mixed	3.0
European	10.0
African American	1.0
Filipino	0.7
Irish/Scottish	3.0
Asian	3.0
Caribbean	0.7
Hispanic	0.7
German	0.7

Table 2*Sport Experience History*

Characteristic	Percent (N = 145)
Main Sport Played	
Hockey	4.0
Soccer	6.0
Rugby	0.6
Curling	.06
Swimming	2.0
Gymnastics	2.0
Volleyball	1.0
Badminton	0.6
Rowing	2.0
Lacrosse	0.6
Weightlifting	1.0
Basketball	0.6
Baseball	1.0
Multiple Sports Played	60.0
Number of Sports Played	
One	24.0
Two	28.0
Three	18.0
Four	10.0
Five	1.0
Six	3.0
Twenty	0.6
Highest Level of Competition Played	
National	8.0
University	20.0
Representative	40.0
Recreational	20.0

Table 3*Sport Injury History*

Characteristic	Percent (N = 145)
Injury Causing Absence from Sport	
Yes	71.0
No	22.0
Type of Injury	
Sprain	12.0
Laceration	1.0
Torn Ligament	21.0
Dislocation	5.0
Broken Bone/Fracture	15.0
Nerve Impingement/Trauma	1.0
Bruised Bone	0.6
Concussion	0.6
Cuboid Syndrome	0.6
Torn/Pulled Muscle	8.0
Disc Herniation	0.6
Received Therapy for Injury Obtained	
Yes	64.0
No	30.0
Type of Therapy	
Physical Therapy	44.0
Chiropractic	12.0
Massage	15.0
Surgery	4.0
Multiple	5.0
None	2.0
Laser	0.6
Self-prescribed	0.6
Osteopath	9.0

Table 4*Narrative Mean Scores for Each Dependent Variable*

Narrative	Athlete/ Therapist Motivation	Athlete Interest	Positive Behaviour Change	Therapist Interest	Therapist Efficacy
Narrative 1	I/I	6.48	5.83	6.01	5.87
Narrative 2	E/E	3.15	4.88	4.27	4.56
Narrative 3	E(IM)/E	3.42	4.15	4.24	4.74
Narrative 4	I/E	6.36	5.90	4.49	5.00
Narrative 5	E/I	3.11	5.23	5.77	5.21
Narrative 6	E(IM)/I	3.90	4.71	5.11	5.53

Note. I = Intrinsic Motivation. E = Extrinsic Motivation. IM = Impression Management.

Table 5

Reliability Scores

Narrative	Condition			
	Client Interest in Athletic Therapy	Positive Behaviour Change	Therapist Interest	Therapist Efficacy
Narrative 1	.52	.71	.58	.69
Narrative 2	.65	.82	.84	.73
Narrative 3	.72	.85	.86	.62
Narrative 4	.55	.75	.84	.76
Narrative 5	.75	.66	.48	.62
Narrative 6	.50	.70	.69	.56

Note. Reliability scores are calculated using Cronbach - α .

Appendices

Appendix A: Study Questionnaire

Section 1: Demographics

This first part of the questionnaire is designed to describe the people who participate in this study. All information received is held in confidence. Please provide your...

Age YEARS

Please check one of the following...

What is your sex?

Male Female

What is your current marital status?

Married/Common Law Widowed Separated/Divorced Single

What is the highest educational qualification you currently hold?

High School Diploma University/College Degree Graduate Degree

What is your current employment status?

Full-Time Employed Part-Time Employed Unemployed

How would you describe your ethnic origin?

Aboriginal Caucasian/White Asian Other

What organized sports do you play? Please list in order of most often played.

How many years have you played organized sport?

What is the highest level of competition of organized sport you have played?

National University Rep Recreational Other:

Have you ever had an injury that caused you to be absent from organized sport?

Yes No

If you answered yes to the previous question, please state the longest length of time absent.

Have you ever received therapy for an injury obtained while playing organized sports?

Yes No

What type of other therapy have you had for a sports injury?

Physical Therapy Chiropractic Massage Therapy Surgery Other:

Rate your overall experience in the above listed therapy from 1 (dislike) to 10 (would recommend to a friend).

INSTRUCTIONS

This study is investigating how people understand **athletic injury** and professional treatment for **these injuries to return to play**. You will be asked to read a short story about events that occurred in a fictitious person's life.

Carefully read the story to yourself, two times. Try to vividly imagine each event that is happening.

After you read the story, you will answer some questions about the content of the passage. Even though the story is short and doesn't contain a lot of information, try to vividly imagine and fill in all of the details of the story as you read it.

Remember, there are no right or wrong answers, and your responses are entirely confidential and anonymous. We are interested in how you understand the story and how you vividly imagine the details left out of the scenario.

IF YOU HAVE ANY QUESTIONS, PLEASE ASK THE RESEARCHER NOW

**IF YOU HAVE NO QUESTIONS, PLEASE TURN TO THE NEXT PAGE
AND READ THE STORY TWICE, TRYING TO VIVIDLY IMAGINE THE DETAILS**

Chris Smith is a highly competitive soccer player. Chris has played soccer his whole life, he plays everyday, even if that means going to a field alone to kick the soccer ball around to practice. Several weeks ago, in a game, Chris seriously injured his knee while going in for a tackle. Chris had to leave the game right away, and was taken off the field in a stretcher. After being assessed by an athletic trainer, Chris was told that he strained his ACL (anterior cruciate ligament) and would need at least 6 weeks of athletic therapy to strengthen his knee, and be healthy enough to play again.

Even though he did not want to go, Chris knew his coach would not let him play, so he went to the athletic therapist to set up his first session in order to impress his coach in hopes of being able to play sooner.

Chris showed up at the treatment centre at the appointed time. After checking in, he took a seat and waited for the therapist to arrive.

“Hi, you must be Chris, I’m Alison”, said the therapist, upon entering the room.

“Yes, hello. Pleased to meet you”, said Chris.

As they walked toward the therapist’s office, Chris asked: “So, how long have you been an athletic therapist?” “About two years now as a student volunteer for the sports medicine clinic. I find it very rewarding to see people return to the sport they love to play. Anyway, please have a seat. I thought we’d begin by discussing why you are here today, Chris”.

Please hand in this booklet once you have completed the online questionnaire.

For the following questions, please indicate the number that best reflects your own personal opinion.

Remember, there are no right or wrong answers, and your responses are entirely confidential and anonymous.

1. Chris is going to treatment because he really wants to.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

2. The therapist is treating Chris because of the money she earns.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

3. Chris is going to treatment because he feels pressure to.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

4. The therapist is treating Chris because she is genuinely interested in helping.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

*Questions 5 - 13 ask about how Chris is likely to react to **athletic therapy**. Even though the story didn't contain detailed information, answer each question based on how you imagine Chris probably thinks and feels in this situation.*

5. Chris is interested in athletic therapy for recovering from injury.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

6. Chris will succeed in recovering from injury.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

7. Chris will find athletic therapy to be a valuable experience.

1	2	3	4	5	6	7
Strongly Disagree			Neutral			Strongly Agree

8. Chris will probably drop out of athletic therapy before it is over.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

9. Chris will definitely be healthy enough to return to play soccer.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

10. Chris probably thinks that athletic therapy is a waste of time.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

11. Chris will probably put a lot of effort into getting better in athletic therapy.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

12. Chris probably believes that being in athletic therapy will be a valuable experience.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

For Questions 13 - 21, please base your ratings on how Chris would likely react to the athletic therapist.

13. Chris would believe that the athletic therapist really wanted to give treatment.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

14. The athletic therapist will be very effective in helping Chris.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

15. The athletic therapist will establish a warm, caring relationship with Chris.

1	2	3	4	5	6	7
Strongly		Neutral			Strongly	

Disagree

Agree

16. The athletic therapist is interested in helping Chris.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

17. The athletic therapist probably won't do much good for Chris.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

18. Chris probably feels really distant from the athletic therapist.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

19. Chris believes that the athletic therapist really wants to help people.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

20. The athletic therapist could probably empathize with the struggles that Chris would have during therapy.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

21. The athletic therapist will be very effective in helping Chris with his recovery from injury and return to play.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

Question 22 asks about your general reactions to Chris.

22. If you ran into Chris six months from now and he told you that he was completely healthy and playing soccer again, how likely would you be to believe him?

1	2	3	4	5	6	7
Not at all likely					Very likely	

*Questions 23 - 24 ask about your beliefs about **athletic therapy** in general. Please fill in a number on the computer sheet that best reflects your own personal opinion.*

23. Athletic therapy is the best way to return to play (compared to rest or no treatment)

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

24. Athletic therapy is a huge commitment for an athlete to make.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

*Questions 25 - 26 concern your attitudes toward the use of pressure to force people into treatment for **athletic injury**. There are no right or wrong answers, and your responses are strictly anonymous and confidential.*

25. In your opinion, approximately what percentage of people with an athletic injury would benefit from treatment if they volunteer for it?

- (1) None of the people
- (2) Some of the people (e.g., 10 - 40 %)
- (3) About half (50 %) of the people
- (4) Most of the people (e.g., 60 - 80 %)
- (5) Almost all of the people

26. In your opinion, approximately what percentage of people with an athletic injury would benefit from treatment if they were forced into it?

- (1) None of the people
- (2) Some of the people (e.g., 10 - 40 %)
- (3) About half (50 %) of the people
- (4) Most of the people (e.g., 60 - 80 %)
- (5) Almost all of the people

For each of the next six questions, please indicate your level of agreement with each of the following statements by circling the number on the answer sheet that best reflects your opinion.

27. People should be allowed to decide for themselves whether they go into athletic therapy for their injury.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

28. The best way to help a person with an injury is to force them into athletic therapy.

1	2	3	4	5	6	7
Strongly		Neutral			Strongly	

Disagree

Agree

29. People with the injury should have the final say over whether or not they receive athletic therapy

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

30. Anybody who has an injury should be forced by their coach to enter athletic therapy programs.

1	2	3	4	5	6	7
Strongly Disagree		Neutral			Strongly Agree	

*The next three questions ask you to judge how appropriate it would be to force people into treatment for **their injury** under various circumstances. Fill in a number on the answer sheet to indicate your opinion.*

31. A **professional athlete**, who is constantly reinjuring himself or herself because they refuse to get help.

1	2	3	4	5	6	7
A very bad idea to force this person into treatment					A very good idea to force this person into treatment	

32. A **high school player** who has a slight ankle sprain.

1	2	3	4	5	6	7
A very bad idea to force this person into treatment					A very good idea to force this person into treatment	

33. An **elite soccer player** who has just had surgery for an ACL tear.

1	2	3	4	5	6	7
A very bad idea to force this person into treatment					A very good idea to force this person into treatment	

For each of the following statements, please indicate how true it is for you, using the following scale:

1 2 3 4 5 6 7
not at all somewhat true true

	Not At All		Somewhat	True		True
Chris enjoyed doing athletic therapy very much	1	2	3	4	5	6 7
Athletic therapy was fun to do for Chris	1	2	3	4	5	6 7
Chris thought athletic therapy was boring	1	2	3	4	5	6 7
Athletic therapy did not hold Chris' attention at all	1	2	3	4	5	6 7
Chris would describe athletic therapy as very interesting	1	2	3	4	5	6 7
Chris would think athletic therapy was quite enjoyable	1	2	3	4	5	6 7
While Chris was doing athletic therapy, he was most likely thinking about how much he enjoyed it	1	2	3	4	5	6 7

	Not At All	Somewhat	True	True	True	True	True
Chris put a lot of effort into athletic therapy	1	2	3	4	5	6	7
Chris didn't try very hard to do well in athletic therapy	1	2	3	4	5	6	7
Chris tried very hard in athletic therapy	1	2	3	4	5	6	7
It was important to Chris to do well in athletic therapy	1	2	3	4	5	6	7
Chris didn't put much energy into athletic therapy	1	2	3	4	5	6	7
Chris most likely did not feel nervous at all while doing athletic therapy	1	2	3	4	5	6	7
Chris probably felt very tense while doing athletic therapy	1	2	3	4	5	6	7
Chris was very relaxed while doing athletic therapy	1	2	3	4	5	6	7
Chris was most likely anxious while working on recovery in athletic therapy	1	2	3	4	5	6	7
Chris felt pressure while doing athletic therapy	1	2	3	4	5	6	7

Appendix B: Narratives

INSTRUCTIONS

This study is investigating how people understand **athletic injury** and professional treatment for **these injuries to return to play**. You will be asked to read a short story about events that occurred in a fictitious person's life.

Carefully read the story to yourself, two times. Try to vividly imagine each event that is happening.

After you read the story, you will answer some questions about the content of the passage. Even though the story is short and doesn't contain a lot of information, try to vividly imagine and fill in all of the details of the story as you read it.

Remember, there are no right or wrong answers, and your responses are entirely confidential and anonymous. We are interested in how you understand the story and how you vividly imagine the details left out of the scenario.

IF YOU HAVE ANY QUESTIONS, PLEASE ASK THE RESEARCHER NOW

**IF YOU HAVE NO QUESTIONS, PLEASE TURN TO THE NEXT PAGE
AND READ THE STORY TWICE, TRYING TO VIVIDLY IMAGINE THE DETAILS**

Extrinsic Motivation (Impression management)-Intrinsic Motivation

Chris Smith is a highly competitive soccer player. Chris has played soccer his whole life, he plays everyday, even if that means going to a field alone to kick the soccer ball around to practice. Several weeks ago, in a game, Chris seriously injured his knee while going in for a tackle. Chris had to leave the game right away, and was taken off the field in a stretcher. After being assessed by an athletic trainer, Chris was told that he strained his ACL (anterior cruciate ligament) and would need at least 6 weeks of athletic therapy to strengthen his knee, and be healthy enough to play again.

Even though he did not want to go, Chris knew his coach would not let him play, so he went to the athletic therapist to set up his first session in order to impress his coach in hopes of being able to play sooner. Chris thought that no matter what, he had to try and make a good impression on his coach.

Chris showed up at the treatment centre at the appointed time. After checking in, he took a seat and waited for the therapist to arrive.

“Hi, you must be Chris, I’m Alison”, said the therapist, upon entering the room.

“Yes, hello. Pleased to meet you”, said Chris.

As they walked toward the therapist’s office, Chris asked: “So, how long have you been an athletic therapist?” “About two years now as a student volunteer for the sports medicine clinic. I find it very rewarding to see people return to the sport they love to play. Anyway, please have a seat. I thought we’d begin by discussing why you are here today, Chris”.

Please hand in this booklet once you have completed the online questionnaire.

Extrinsic Motivation-Intrinsic Motivation

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Chris does not believe therapy will work, he thinks he is fine but his coach will not let him play or practice until he is cleared by the athletic trainer, and he will not be cleared unless he is completely healthy. Chris thought that no matter what happened, he had to follow through with what his coach wanted.

Chris showed up at the treatment centre at the appointed time. After checking in, he took a seat and waited for the therapist to arrive.

“Hi, you must be Chris, I’m Alison”, said the therapist, upon entering the room.

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Intrinsic Motivation-Extrinsic Motivation

Chris Smith is a highly competitive soccer player. Chris has played soccer his whole life, he plays everyday, even if that means going to a field alone to kick the soccer ball around to practice. Several weeks ago, in a game, Chris seriously injured his knee while going in for a tackle. Chris had to leave the game right away, and was taken off the field in a stretcher. After being assessed by an athletic trainer, Chris was told that he strained his ACL (anterior cruciate ligament) and would need at least 6 weeks of athletic therapy to strengthen his knee, and be healthy enough to play again.

Chris wanted to start therapy right away so he can play again, so he scheduled his first session with the athletic trainer because he wants to get better for himself, no matter how long he needs to stay in rehabilitation. Chris thought that no matter what, he was interested in getting help for himself.

Chris showed up at the treatment centre at the appointed time. After checking in, he took a seat and waited for the therapist to arrive.

“Hi, you must be Chris, I’m Alison”, said the therapist, upon entering the room.

“Yes, hello. Pleased to meet you”, said Chris.

As they walked toward the therapist’s office, Chris asked: “So, how long have you been an athletic therapist?” “About two years now as a paid student employee for the sports medicine clinic. Frankly, athletic therapy is difficult and demanding work, but the pay I get makes it worth all the effort. Anyway, please have a seat. I thought we’d begin by discussing why you are here today, Chris”.

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Appendix D: Verbal Presentation Script

Hello, my name is **Sarah Deck** and I am a Research Associate in the Faculty of Applied Health Sciences at Brock University. I am currently working in the Behavioural Health Science Research Lab at Brock University with **Dr. Philip M. Wilson** where I am completing doing my master's thesis. I am here today to discuss with you a project that we are currently recruiting participants for entitled "Motivation Toward Athlete Recovery".

The purpose of this study is to understand more about how the motivation of athletes, therapists and coaches effect the overall outcome of injury recovery treatment.

If you volunteer as a participant in this study, you will be asked to read a short narrative and complete a series of questions in a survey designed specifically for this research project. The questions contained within the survey will ask about the narrative, questions about motivation and some demographic questions like age, gender, and sport injury history. Your involvement should take no longer than 30-35 minutes and we ask that you provide us with information on a single occasion.

All data we collect are anonymous and will remain confidential. The benefits and risks are outlined in our LOI and IC for your information. I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Services at Brock University. However, the final decision about participation is yours and you can change your mind at any time throughout the duration of the project without any repercussion.

If you are interested in participating, please take and read one of the information letters and then we can discuss the next steps if you are interested in further involvement.

Appendix E: Electronic Presentation Script

Good Morning/Evening:

I am contacting you on behalf of Dr. Philip M. Wilson and Sarah Deck who are both with the Faculty of Applied Health Sciences at Brock University. You are being invited to participate in this project entitled "Motivation Toward Athlete Recovery". The project is designed to understand more about how the motivation of athletes, therapists and coaches effect the overall outcome of injury recovery treatment. Should you choose to participate, the information that you provide will help us understand the role of different goals and motives considered to be important for participating in weight training. Your participation in this study will involve completing a series of questions on a survey designed specifically for this study that will take approximately 30-35 minutes of your time. Your participation is voluntary and all of the information that you provide will remain confidential. This means that we will not be sharing your personal information with any other person or party in such a manner that you could be identified as a consequence of participating in this study.

Please direct any questions or concerns about this study to either Dr. Philip M. Wilson (pwilson4@brocku.ca) or Sarah Deck (sd14sh@brocku.ca) using the email addresses provided.

Thank you for your time and effort. This study has been reviewed and received ethics clearance through Brock University's Research Ethics Board (File # 15-008 WILSON)

Respectfully submitted,

Sarah Deck, BSc
Philip M. Wilson, PhD

Appendix F: Portal/Listserv Recruitment Scripts

Good Morning/Evening:

I am contacting you on behalf of Dr. Philip M. Wilson and Sarah Deck who are both with the Faculty of Applied Health Sciences at Brock University. You are being invited to participate in this project entitled "Motivation Toward Athlete Recovery". The project is designed to enhance our understanding about how motivation can effect the treatment recovery for athletes. Should you choose to participate, the information that you provide will help us gain a greater understanding of the role of motivation in the athletic recovery process, which may have key implications for coaches and athletic therapists helping, injured athletes entering recovery treatment. Your participation in this study will involve completing a series of questions on a survey designed specifically for this study that will take approximately 30-35 minutes of your time. Your participation is voluntary and all of the information that you provide will remain confidential which means that we will not be sharing your personal information with any other person or party in such a manner that you could be identified as a consequence of participating in this project.

Please direct any questions or concerns to either Dr. Wilson or Sarah Deck via e-mail at sd14sh@brocku.ca

Thank you for your time and effort. This study has been reviewed and received ethics clearance through Brock University's Research Ethics Board (File # 15-008 WILSON)

Respectfully submitted,

Sarah Deck, BSc
Philip M. Wilson, PhD

Appendix G: Letter of Invitation

Letter of Invitation

June 9, 2015

Title of Study: Project Motivation Toward Athlete Recovery

Principal Investigator: Philip M. Wilson, PhD, Dept. of Kinesiology, Brock University

Student Principal Investigator: Sarah Deck, BSc, Graduate Student, Applied Health Sciences, Brock University

I, Sarah Deck, BSc, Graduate Student, from the Faculty of Applied Health Sciences, Brock University, invite you to participate in a research project entitled "Motivation Toward Athlete Recovery".

The purpose of this research project is to understand more about how the motivation of athletes, therapists and coaches **affect** the overall outcome of injury recovery treatment. Should you choose to participate, you will be asked to read a short narrative and complete a series of questions in a survey designed specifically for this research project. The questions contained within the survey will ask about the narrative, motivation, and some demographic questions like age, sport participation, and sport injury history.

The expected duration of your involvement should take no longer than 30-35 minutes. We ask that you provide us with all information on a single occasion. Please note that you are free to participate in this study, not participate in this study, or withdraw your participation form this study even after you have consented to be involved at any time without impacting your academic standing at Brock University.

This research should benefit professionals who work with injured athletes by helping to gain a greater understanding of the role of motivation in the injury recovery process, which may have key implications for coaches and athletic therapists.

If you have any questions about your rights as a research participant, please contact the Brock University Research Ethics Officer (905 688-5550 ext. 3035, reb@brocku.ca)

If you have any questions about this research project, please feel free to contact me (see below for contact information).

Thank you,

Philip M. Wilson, PhD
Associate Professor
Email: pwilson4@brocku.ca
Tel: 905 688 5550 Ext. 4997

Sarah Deck, BSc Kin
Principal Student Investigator
Email: sd14sh@brocku.ca
Tel: 905 688 5550 Ext. 5564

This study has been reviewed and received ethics clearance through Brock University's Research Ethics Board [**File #15-008 WILSON**].

Appendix H: Informed Consent

Informed Consent

Date: **June 9, 2015**

Project Title: Motivation Toward Athlete Recovery

Principal Investigator (PI): Philip M. Wilson, PhD
Department of Kinesiology
Brock University
905 688 5550 Ext. 4996; pwilson4@brocku.ca

Student Principal Investigator (SPI): Sarah Deck, BSc, Graduate Student
Faculty of Applied Health Sciences
Brock University
(905) 688-5550 Ext. 5564; sd14sh@brocku.ca

INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to understand more about how the motivation of athletes, therapists and coaches effect the overall outcome of injury recovery treatment.

WHAT'S INVOLVED

As a participant, you will be asked to come to Welsh Hall Room 141 on Brock University Campus, where after giving consent you will read a short narrative, then complete a series of questionnaires online in a survey designed specifically for this research project. Questions will ask about the narrative, about motivation and will also include demographics such as age, gender, and sport history. Participation should take approximately 30-35 minutes of your time on a single occasion.

POTENTIAL BENEFITS AND RISKS

Possible benefits of participation include (a) receiving aggregate feedback regarding the overall findings of this investigation. Additional indirect benefits may include, but are not limited to, the following: (a) Contribution to improved assessment of motivation toward athlete recovery and information that can be used to by therapists and coaches to improve efficacy and effectiveness of athletic therapy; and (b) Opportunities to be involved in the research being conducted within the Behavioural Health Science Research Lab (BHSRL) at Brock University.

There are no known or anticipated risks associated with participation in this study.

CONFIDENTIALITY

All information you provide is considered confidential and anonymous; your name will not be included or, in any other way, associated with the data collected in the study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research.

Data collected during this study will be stored on a password-protected server and/or in a locked filing cabinet in the Behavioural Health Sciences Research Lab (Welch Hall 141) for the duration of the study. Data will be kept for a period of 5-years post publication as determined by the guidelines set forth by the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (2010) document, after which time all electronic files will be erased from any and all hard drives. Any printed materials (e.g., the list of participants requesting feedback) will be destroyed using a paper shredder upon completion of the study.

Access to this data will be restricted to those involved in the study, exclusively the principal investigator (Dr. Philip M. Wilson) and the principal student investigator (Sarah Deck).

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available once all data has been collected and/or analyzed for the study. It is anticipated that this may take between 3-6 months to complete after the final set of participants have completed their involvement in the research study. For feedback summary of the results of this study please contact either Dr. Philip M. Wilson or Sarah Deck using the contact information provided.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact Dr. Philip M. Wilson or Sarah Deck using the contact information provided. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University [File # 15-008 WILSON]. If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent and/or my participation at any time.

Please check only one of the following options:

- I consent to participate in this study

- I do not consent to participate in this study

Date: _____

Appendix I: Participant Debriefing Form

At the end of this study, you will have the opportunity to receive overall feedback in terms of the main summary findings from this research project. The summary of main findings will not identify anyone personally in the presentation of the information so any data you choose to provide will be retained in the strictest confidence.

Please click the box next to each statement that applies to you:

- I would like to receive a brief summary of the final results from this study**

If you clicked the box above to indicate you would like feedback or consideration for one of the prizes associated with this study, a member of our research team will need to contact you directly to send you a summary of the study results in a.pdf file. Please insert a contact email we can use to send the summary results below.

Contact e-mail (please
print):
