AN EXAMINATION OF ELLIOT'S HIERARCHICAL MODEL OF APPROACH AND AVOIDANCE ACHIEVEMENT MOTIVATION IN ATHLETES RETURNING TO SPORT FOLLOWING SERIOUS INJURY

by

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STATEMENT OF THESIS APPROVAL

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ABSTRACT

Sport injury is both a physical and psychological event. Some athletes may still be recovering psychologically even after their bodies have healed. Research has found that athletes who return to sport before they are psychologically ready may be at risk of experiencing maladaptive appraisals and performance outcomes. On the other hand, research has also shown that athletes may experience adaptive outcomes after injury such as improved performance and personal growth.

In an effort to determine possible factors contributing to the disparity between these postinjury appraisals and experiences, the purpose of this study was to retrospectively explore the potential mediating effect of achievement goals on perceived competence and return-to-sport outcomes among college athletes who have recovered from a serious sport injury. The sample consisted of 75 male and female college athletes who returned to sport after having missed at least 3 weeks due to injury. Participants completed a survey measuring perceived competence, achievement goals, and return-to-sport outcomes.

Results indicated that task-approach goals significantly mediated the relationship between perceived competence and a renewed perspective. These findings suggest that athletes who believed themselves to be capable and proficient in their sport after having recovered from injury were motivated by goals to perform well, to be effective, and to

obtain good results. In turn, the pursuit of such goals facilitated perceptions of beneficial outcomes including greater enjoyment, mental toughness, understanding of relevant sport skills and strategies, motivation for sports success, and appreciation of sport.

This study is the first to look at achievement goals in the context of sport injury. It offers promising avenues for future research as well as a number of practical implications. Progressive functional tests and psychological interventions such as imagery and self-talk could assist in building or maintaining athletes' perceived competence. Additionally, coaches and significant others may do well to use language that orients the athlete towards attaining success as opposed to avoiding failure, to emphasize effort, task completion, and correct form, and to avoid comments that compare the athlete to others or to his/her preinjury standards of performance.

TABLE OF CONTENTS

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INTRODUCTION

Sustaining an injury is an inherent risk of sport and one that is prevalent among college athletes. The Datalys Center (2014) reported 4.3 to 8.1 injuries per 1,000 athlete exposures in the National Collegiate Athletic Association (NCAA). Furthermore, 12-20% of these injuries resulted in 21 or more days of lost playing time, indicating a certain level of severity (Datalys Center, 2014). While the physical consequences of sport injury are self-evident, the profound psychological impact of injury on competitive athletes is now well documented (e.g., Bianco, 2001; Johnston & Carroll, 1998; Podlog, Dimmock, & Miller, 2011; Wadey, Evans, Hanton, & Neil, 2012). Psychosocial factors associated with sport injury may positively or negatively influence athletes' experiences throughout the various phases of sport injury recovery. An increasing area of interest is exploring the psychosocial factors influencing athletes' return to sport following injury rehabilitation (Ardern, Taylor, Feller, & Webster, 2013). In particular, athlete's appraisals and emotions regarding their upcoming return to competition may have important implications for the effectiveness of their return (Podlog & Eklund, 2010).

Athlete appraisals and emotions regarding a return to sport

Although negative emotional responses to injury are typically strongest immediately following the onset of injury and diminish throughout the rehabilitation phase, negative appraisals and emotions have been reported during the return-to-sport

phase (Podlog & Eklund, 2007). Common concerns among athletes returning to sport after injury include doubts in their ability to adequately meet the demands of the sport (Clement, Arvinen-Barrow, & Fetty, 2015; Gould, Udry, Bridges, & Beck, 1997), fears of reinjury (e.g., Bianco, 2001; Clement et al., 2015; Gould et al., 1997; Johnston & Carroll, 1998; Podlog & Eklund, 2006; Podlog, Kleinert, Dimmock, Miller, & Shipherd, 2012), uncertainties about their ability to perform to preinjury standards (Podlog et al., 2011; Podlog & Eklund, 2007; Podlog et al., 2013), worries over falling behind competitors or teammates (Tracey, 2003), and concerns about self-presentation (Podlog et al., 2011; Podlog & Eklund, 2006; Tracey, 2003).

Apart from negative cognitive appraisals, many athletes report experiencing positive appraisals regarding their upcoming return to sport (Clement et al., 2015; Podlog & Eklund, 2005, 2006). Following restriction of one's athletic activities, athletes may be eager to return to sport and excited about the prospect of demonstrating their athletic proficiency (Podlog et al., 2012; Podlog et al., 2013; Tracey, 2003; Wadey et al., 2012). They may also view their return as an opportunity to attain personal goals such as re-gaining preinjury performance levels, improving skills, maintaining fitness levels, achieving personal bests, and preserving athletic identity (Podlog & Eklund, 2006). The aforementioned research suggests a dichotomy of competence-based appraisals during the return-to-sport phase of injury whereby athletes are simultaneously motivated to avoid demonstrating incompetence (i.e., to avoid a negative outcome) and to demonstrate competence (i.e., to approach a positive outcome or eventuality).

Return-to-sport outcomes following injury rehabilitation

Although injury may be a negative event, research on the return-to-sport phase has revealed that the chaos and disruption of injury has the potential to induce positive or adaptive outcomes. Gould and colleagues (1997) categorized these outcomes as (1) *personal growth benefits*, such as gaining a new perspective (Podlog & Eklund, 2006) and an increased appreciation of their health (Tracey, 2003); (2) *psychologically-based performance enhancements,* such as increased mental toughness and resilience (Podlog & Eklund, 2006, 2009; Podlog et al., 2013; Tracey, 2003); and (3) *physical benefits,* such as improvements in strength, technical and tactical refinement, and increased knowledge of injury prevention (Podlog & Eklund, 2006; Udry, Gould, Bridges, & Beck, 1997; Wadey, Evans, Evans, & Mitchell, 2011).

In their research assessing types of return-to-competition outcomes, Podlog and Eklund (2005) categorized adaptive outcomes as "a renewed perspective" and maladaptive outcomes as "return concerns." Maladaptive outcomes after injury typically include (1) heightened competitive anxiety (Bianco, Malo, & Orlick, 1999; Johnston & Carroll, 1998; Podlog & Eklund, 2006), (2) lower levels of confidence (Evans, Hardy, & Fleming, 2000; Johnston & Carroll, 1998; Podlog & Eklund, 2006, 2007; Podlog et al., 2012), (3) perceptions of diminished postinjury performances (Kvist, Ek, Sporrstedt, & Good, 2005), (4) competing with apprehension and anxiety over reinjury (Clement et al., 2015; Johnston & Carroll, 1998; Podlog & Eklund, 2006; Podlog et al., 2012; Podlog et al., 2013; Tracey, 2003; Walker, Thatcher, & Lavallee, 2010), and (5) actual reinjury (Podlog, Heil, & Schulte, 2014; Podlog, Kleinert, Dimmock, Miller, & Shipherd, 2012). Given the possibility that returning athletes may experience a mixture of adaptive and

maladaptive outcomes following the return to competition, it seems worth investigating variables (e.g., competence appraisals) that potentially promote more positive return-to-sport outcomes.

Achievement goal theory and the return to sport following injury

Considering research indicating that perceptions of competence may be at the forefront of athletes' minds as they return to sport after injury (Podlog & Eklund, 2007), and that athletes strive to either demonstrate competence or avoid demonstrating incompetence, it seems prudent to consider a competence-based theory in examining relevant psychosocial factors impacting athletes' return-to-sport outcomes following injury. As such Elliot's hierarchical model of approach and avoidance achievement motivation (Elliot & Church, 1997) grounded in achievement goal theory (AGT) was selected in order to examine relationships between formerly injured athletes' competence perceptions regarding their performance capabilities, approach and avoidance achievement motivations, and their return-to-sport outcomes.

According to AGT, an achievement goal is conceptualized as the purpose or aim of competence-based action (Elliot & Conroy, 2005) and is posited to regulate how individuals interpret, experience, and act in achievement settings (Elliot & Church, 1997). Recently, the 2x2 achievement goal model was expanded by Elliot (Elliot, Murayama, & Pekrun, 2011) into the 3x2 model. Mascret, Elliot, and Cury (2015) declared that the 3x2 model allows for greater precision and rigor in explaining the nature of achievement motivation in the sport domain. Within the 3x2 model, there exist six goals that emerge from crossing the *definition* of competence (task—self—other) with

the *valence* of competence (approach—avoidance). These goal types are depicted in Figure 1 (Elliot et al., 2011). The definition of competence can be divided into *task-referenced* goals, where the focus is on whether you are (or are not) accomplishing the set task; *self-referenced goals*, where the focus is on how you are doing relative to how you have done in the past or how you may do in the future; and *other-referenced goals*, where the focus is on how you are doing relative to others (Mascret et al., 2015). The valence of competence refers to the distinction between approach motivation, where behavior is directed by a positive/desirable event or possibility, and avoidance motivation, where behavior is directed by an avoidance of a negative/undesirable event or possibility (Elliot & Covington, 2001).

When the two dimensions are crossed, the six resultant goals are (1) task-approach (TAp; to demonstrate task-referenced competence), (2) self-approach (SAp; to demonstrate self-referenced competence), (3) other-approach (OAp; to demonstrate other-referenced competence), (4) task-avoidance (TAv; to avoid demonstrating task-referenced incompetence), (5) self-avoidance (SAv; to avoid demonstrating self-referenced incompetence), and (6) other-avoidance (OAv; to avoid demonstrating other-referenced incompetence) (Mascret et al., 2015).

Currently, there is a dearth of research conducted using the 3x2 model of achievement. Such an absence is likely attributable to the relatively recent construction of the 3x2 achievement goal questionnaire (3x2 AGQ; Elliot et al., 2011), and the even more recent adaptation of the measure for the sports context (3x2 AGQ-S; Mascret et al., 2015). There is, however, a plethora of literature on the dichotomous model of achievement goal theory (Elliot, 1999) in sport, although none in the context of sports

injury. Within the dichotomous model, task- and self-referenced goals are combined under the term *mastery goals* and other-referenced goals are synonymous with *performance goals*. Each of these goals is associated with a number of adaptive and maladaptive outcomes.

Mastery approach (MAp) goals are theoretically the most adaptive achievement goal and in sport have been shown to positively predict beneficial outcomes such as intrinsic motivation and enjoyment (Adie & Jowett, 2010; Conroy, Kaye, & Coatsworth, 2006; Jaakkola, Ntoumanis, & Liukkonen, 2016; Li et al., 2011; Morris & Kavussanu, 2009; Nien & Duda, 2008; Puente-Diaz, 2012, 2013; Trenz, & Zusho, 2011), positive affect (Adie, Duda, & Ntoumanis, 2008, 2010; Nicholls, Perry, & Calmeiro, 2014), well-being (Adie, Duda, & Ntoumanis, 2008, 2010; Li, 2010), and performance (Li, 2010; Li et al., 2011; Lochbaum & Gottardy, 2014; Lochbaum & Smith, 2015; Puente-Díaz, 2012; Stoeber & Crombie, 2010; Vallerand et al., 2008). In addition, MAp goals have been shown to negatively predict maladaptive outcomes such as self-handicapping (Kavussanu, Morris, & Ring, 2009; Ntoumanis, Thøgersen-Ntoumani, & Smith, 2009), anxiety (Li, 2013), and externally regulated forms of motivation as well as amotivation (Conroy, Kaye, & Coatsworth, 2006; Nien & Duda, 2008).

Mastery-avoidance (MAv) goals are believed to have a more maladaptive pattern of consequences than MAp goals but a more adaptive pattern than performance-avoidance (PAv; i.e., other-avoidance goals; Elliot & McGregor, 2001). In the sport literature, MAv goals have been found to positively predict maladaptive outcomes including amotivation (Conroy et al., 2006; Nien & Duda, 2008), threat appraisals (Adie et al., 2008; Nicholls, Perry, & Calmeiro, 2014), low self-esteem (Adie et al., 2008;

Isoard-Gautheur, Guillet-Descas, & Duda, 2013), anxiety (Li, 2013; Morris & Kavussanu, 2009; Stenling, Hassmén, & Holmström, 2014), and negative affect (Adie et al., 2008; Schantz & Conroy, 2009) as well as negatively predict adaptive outcomes such as well-being (Adie et al., 2008, 2010) and intrinsic motivation (Conroy, Kaye, & Coatsworth, 2006). Research on the 3x2 model suggests that task- and self-referenced goals likely differentially predict the aforementioned achievement outcomes of mastery goals (Elliot et al., 2011; Mascret et al., 2015).

Performance-approach (PAp) goals reveal an assortment of adaptive and maladaptive outcomes. Adaptive outcomes from adopting PAp goals include enhanced perceptions of self-confidence (Cetinkalp, 2012; Stoeber & Crombie, 2010), well-being (Li, 2010), and performance (Bois, Sarrazin, Southon, & Boiché, 2009; Halvari & Kjørmo, 1999; Lochbaum & Gottardy, 2014; Stoeber & Crombie, 2010; Stoeber, Uphill, & Hotham, 2009). On the other hand, examples of maladaptive outcomes predicted by performance-approach goals in sport include threat appraisals (Adie et al., 2008), self-handicapping (Kavussanu et al., 2009), emotional and physical exhaustion (Isoard-Gautheur et al., 2013), and negative reactions to imperfection (Stoeber, Stoll, Pescheck, & Otto, 2008).

Performance-avoidance (PAv) goals are conceptualized as the most maladaptive achievement goal. In sport, PAv goals have been shown to positively predict maladaptive outcomes including anxiety (Li, 2013; Morris & Kavussanu, 2009; Stenling et al., 2014), threat appraisals (Nicholls et al., 2014), self-handicapping (Ntoumanis et al., 2009), amotivation (Nien & Duda, 2008), and negative reactions to imperfection (Stoeber et al., 2008). Additionally, PAv goals have been negatively associated with adaptive

outcomes such as challenge appraisals (Adie et al., 2008), health and well-being (Lench, Levine, & Roe, 2010; Li, 2010), and performance (Halvari & Kjørmo, 1999; Li, 2010; Li et al., 2011; Stoeber et al., 2009; Vallerand et al., 2008).

In addition to the outcomes associated with achievement goals, Elliot's hierarchical model of approach and avoidance achievement motivation outlines a number of possible antecedents to goal-adoption, which include perceived competence, motive dispositions (i.e., need to achieve and fear of failure), implicit theories of ability (i.e., entity and incremental), perceptions of motivational climate, and environmental or personal factors (Elliot & Church, 1997). The hierarchical model posits that these antecedents indirectly modify achievement behavior and outcomes through their influence on achievement goal adoption (Cury, Da Fonséca, & Rufo, 2002; Elliot, 1999; Elliot & Church, 1997). Within this model, the terms antecedents and consequences are not meant to imply causality, but rather are used to communicate the proposed nature of the relationships between variables (Elliot et al., 2011).

In the sports literature, antecedents of MAp goals include perceived competence (Morris & Kavussanu, 2008; Nien & Duda, 2008), mastery climates (Morris & Kavussanu, 2008; Skjesol & Halvari, 2005; Trenz & Zusho, 2011), and incremental beliefs of ability (Stenling et al., 2014). MAv goals have been negatively predicted by perceived competence (Isoard-Gautheur et al., 2013) and mastery climates (Trenz, & Zusho, 2011) as well as positively predicted by fear of failure (Conroy & Elliot, 2004) and performance climates (Isoard-Gautheur et al., 2013). Antecedents of PAv goals include entity beliefs about sport ability (Stenling, Hassmén, & Holmström, 2014), fear of failure (Conroy & Elliot, 2004; Halvari & Kjørmo, 1999; Nien & Duda, 2008), and

performance climates (Morris & Kavussanu, 2008; Nien & Duda, 2008). Lastly, PAp goals have been predicted by fear of failure (Nien & Duda, 2008), performance climates (Morris & Kavussanu, 2008; Trenz & Zusho, 2011), and perceived competence (Morris & Kavussanu, 2008; Nien & Duda, 2008). Taking into consideration that perceptions of competence are especially relevant to athletes returning to competition after injury, it seemed prudent to examine perceived competence as an influential antecedent to achievement goal adoption among this population.

Study objectives

Four main conclusions can be drawn from the aforementioned research. First, athletes may have altered perceptions of competence after injury; second, athletes may experience competing approach and avoidance tendencies in their return to competition; third, athletes may perceive a range of adaptive and maladaptive return-to-sport outcomes; fourth and finally, in exploring connections among these variables, it is evident that achievement goals can lead to both positive and negative outcomes in sport and that the adoption of achievement goals is predicted by a number of possible antecedents, including perceived competence. Therefore, using Elliot's hierarchical model of approach and avoidance achievement motivation, the purpose of this study was to retrospectively explore the potential mediating effect of achievement goals on perceived competence and return-to-sport outcomes among collegiate athletes who had recovered from a serious sport injury.

The overall purpose was broken down into three specific purposes, the first of which was to examine whether achievement goals predicted return-to-sport outcomes.

For this purpose, we offered no directional hypothesis. Although previous research suggests that having approach-focused achievement goals are associated with experiencing positive processes and outcomes, it is possible that such goals might be contraindicated among returning athletes. For example, an intense drive to be the best, to successfully accomplish a task, or to be better than they were may impel athletes to make a premature return to sport or to push themselves too hard, thus increasing the likelihood of sustaining reinjury, an additional injury, or decrements in performance. Similarly, although avoidance-focused goals have been linked to maladaptive processes and outcomes, it is possible that pursuing avoidance goals may serve as a protective mechanism in this particular population by motivating them to exercise reasonable caution in order to prevent reinjury and complete a successful return to sport. In addition, considering the minimal research on the 3x2 model of achievement goal theory, we had little research to support a hypothesis for the definitions of competence (i.e., task-, self-, and other-referenced) in predicting return-to-sport outcomes.

The second specific purpose was to determine whether athletes' perceived competence before their return predicted return concerns and a renewed perspective. We hypothesized that perceived competence would positively predict a renewed perspective and negatively predict return concerns. When athletes believe they are competent, it seems logical that they would have fewer competence-based return concerns (e.g., worries about falling behind others or uncertainties about regaining preinjury performance levels). Likewise, when athletes feel competent in their postinjury capabilities, they are likely to look forward to and find enjoyment in opportunities to achieve personal goals and demonstrate competence.

The final specific purpose was to examine whether achievement goals mediated the relationship between perceived competence and return-to-sport outcomes. In other words, we wanted to determine whether perceived competence affected these outcomes through its influence on achievement goals. This hypothesis was predicated upon the results of the first two hypotheses. Assuming that both perceived competence and achievement goals were significant predictors of return-to-sport outcomes, we hypothesized that achievement goals would mediate the relationship between perceived competence and return outcomes. As achievement goals are defined and valenced in terms of competence, it was reasonable to expect perceived competence to have a direct influence on achievement goal adoption.

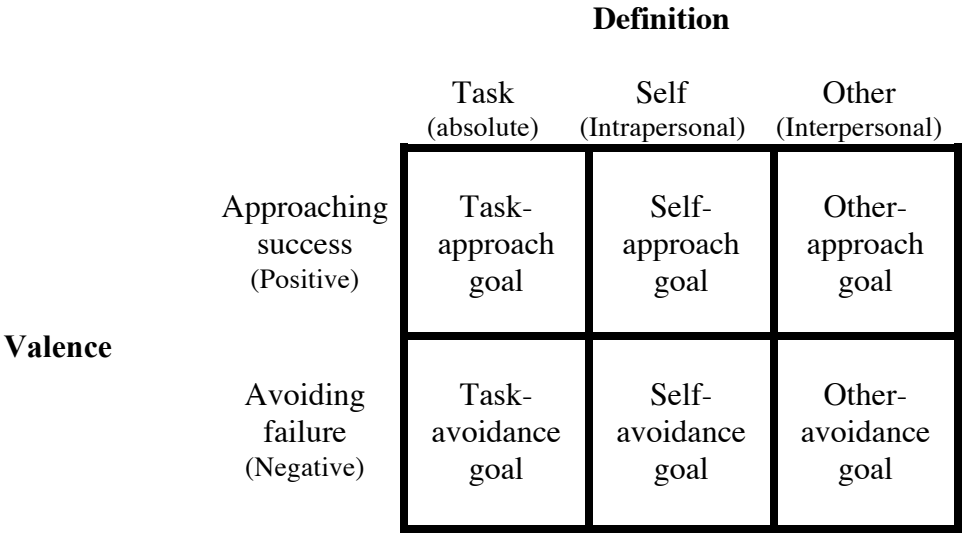

Figure 1. The 3x2 achievement goal framework. Definition and valence represent the two dimensions of competence. Absolute, intrapersonal, and interpersonal represent the three ways in which competence may be defined; positive and negative represent the two ways in which competence may be valenced (Elliot et al., 2011, p. 634).

METHODS

Participants

Seventy-five male and female college athletes (M = 45; F = 30; M_{age} = 21; SD = 2.15) competing in team (basketball: n = *6*, football: n = 7, hockey: n = 1, lacrosse: n = 11, rugby: n = 2, soccer: n = 14, softball: n = 1, volleyball: n = 5, ultimate frisbee: n = 8, cheer: n = 1, field hockey: n = 1, and baseball: n = 1) and individual sports (swimming: n = 4, powerlifting: n = 1, skiing: n = 1, track and field: n = 6, dance: n = 1, cross country: n = 2, wrestling: n = 1, gymnastics: n = 1, and golf: n = 1) volunteered for the study. The levels at which the participants compete included club (n = 21), NCAA Division I (n = 17), NCAA Division II (n = 18), NCAA Division III (n = 3), NAIA (n = 10), and Junior College (n = 3), with 3 unreported levels of competition. Participants had returned from an injury that on average prevented them from participating in regular sport training and/or competition for 21 weeks (range: 3 to 133 weeks), and an average of 10 months (range: 1 to 24 months) before taking part in the study.

Measures

Perceived competence. A modified version of the perceived competence subscale from the intrinsic motivation inventory (IMI; Ryan, 1982) was used to measure the participants' perceptions of competence after receiving clearance to return to competition. Following the stem "After receiving clearance to return to regular training

and/or competition," sample items include, "I felt I wouldn't be able to compete in my sport very well" and "I thought I would be pretty good at my sport." Participants indicated their level of agreement with each of the 5 items on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). Reliability scores are reported in Table 1.

Achievement goals. The 3x2 Achievement Goal Questionnaire for Sport (Mascret et al., 2015) was used to retrospectively measure the degree to which participants endorsed different achievement goals prior to making their return to competition following their most recent serious injury. The stem "In sport, my goal is…" from the original scale was changed to "Upon returning to competition after injury my goal was…" The 3x2 AGQ-S measures six goals, each with three items: task-approach (TAp; e.g., "to perform well"), self-approach (SAp; e.g., "to do better than I usually do"), other-approach (OAp; e.g., "to do better than others"), task-avoidance (TAv; e.g., "to avoid performing badly"), self-avoidance (SAv; e.g., "to avoid having worse results than I had previously"), and other-avoidance (OAv; e.g., "to avoid doing worse than others"). Participants responded on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). The 3x2 AGQ-S has demonstrated good internal consistency ($\alpha > 0.7$) and construct validity (Mascret et al., 2015). Reliability scores in the present investigation are reported in Table 1.

Return to sport outcomes. The Return to Sport After Serious Injury Questionnaire (RSSIQ; Podlog & Eklund, 2005) was used to assess athletes' perceived psychological outcomes of returning to sport after injury. The stem statement, "Within my first season returning to sport after injury…" prefaced each of the 15 items from the

RSSIQ. Ten items of the RSSIQ represent *return concerns* (e.g., "My confidence in performing challenging skills and techniques has been lower;" "My fear of reinjury has interfered with performances;" "My anxiety about competing has been greater;" and "My ability to perform has been affected by my injury") and 5 items represent a *renewed perspective on sport* (e.g., "My enjoyment of practice and competition has been greater;" "My motivation for sport success has been greater;" and "My understanding about how to train/compete has been better"). Participants indicated their level of agreement to each item on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). The scale has demonstrated adequate internal consistency as well as initial construct validity (Podlog & Eklund, 2005). Reliability scores for the scales in the current study are reported in Table 1.

Procedure

After receiving Institutional Review Board (IRB) approval, club coaches and/or captains, athletic trainers, and sport science professors were contacted and invited to share a description of the nature and aims of the study with potential participants. Eligible volunteers were then referred to the primary investigator who provided them the survey and an informed consent cover letter, either via an online link or a paper copy. Consent was considered obtained upon completing the survey online or returning the paper survey to the primary investigator. Completion of the survey took approximately 10 minutes.

Data analyses

Data analysis involved calculating descriptive statistics, internal consistency/reliability scores, and bivariate correlations for all study variables. Item averages for the IMI and each RSSIQ and 3x2 AGQ-S subscales were created. These averages were then correlated with one another in order to provide indications of the strength and direction of the relationships between perceived competence, achievement goals, and return-to-sport outcomes. Based on the correlations observed, two mediation analyses were conducted to explore the potential mediating role of task-approach goals in explaining the link between perceived competence and return to sport outcomes. Significance was determined by examining bootstrapped confidence intervals (Hayes, 2013).

Table 1

Descriptive Statistics, Internal Consistencies, and Correlations Among Perceived Competence, Goals, and Return-to-Sport Outcomes

Variable	*M*	*SD*	Observed Range	Cronbach's α	*r*							
					1	2	3	4	5	6	7	8
1. Perceived competence	3.38	0.77	1.80-5.00	0.78	—							
2. Task-approach goals	6.22	0.55	5.00-7.00	0.76	.30**	—						
3. Task-avoidance goals	5.71	1.37	1.33-7.00	0.92	.14	.31**	—					
4. Self-approach goals	5.28	1.18	2.00-7.00	0.77	.14	.45**	.19	—				
5. Self-avoidance goals	5.42	1.27	1.00-7.00	0.75	.02	.21	.67**	.36**	—			
6. Other-approach goals	5.31	1.27	1.00-7.00	0.86	.13	.39**	.24*	.45**	.43**	—		
7. Other-avoidance goals	5.08	1.43	1.00-7.00	0.84	.04	.15	.72**	.18	.74**	.44**	—	
8. Return concerns	4.13	1.52	1.00-6.50	0.92	-.54**	-.22*	.11	-.08	-.09	-.24*	.04	—
9. Renewed perspective	5.20	1.01	2.40-7.00	0.71	.36**	.44**	.08	.18	.05	.28*	-.02	-.39**

Note. * $p < .05$, ** $p < .01$

RESULTS

Preliminary analyses

The data were cleaned and screened prior to conducting the main analyses. The risk of data entry error was mitigated by re-entering roughly 10% of the data. The data from 5 participants were deleted for not meeting the eligibility criteria of experiencing at least a 3-week absence from sport. A total of six missing data points from 3 different participants were identified and subsequently replaced with the series mean. Given the relatively small sample size, the correlations and mediation analyses were bootstrapped. Bootstrapping is a robust analytic technique that can be applied to nonnormal data, thus making the identification of outliers inessential (Preacher & Hayes, 2004).

Descriptive statistics and bivariate correlations

Descriptive statistics, correlations, and internal reliability scores for all study variables are presented in Table 1. Participants exhibited high scores for all six achievement goals ($M > 5$; range = 1-7) as well as for perceived competence ($M = 3.38$, range = 1-5). Mean scores for the RSSIQ indicate that the participants experienced higher levels of a renewed perspective ($M = 5.20$), or positive psychological return outcomes, than they did return concerns ($M = 4.13$), or negative psychological return outcomes. Internal reliability scores among study variables were deemed acceptable (α range = .71-.92) after removing one item from the self-avoidance goals subscale.

As indicated in Table 1, perceived competence was significantly correlated with the return-to-sport outcomes ($p < .01$). Specifically, a positive correlation was observed between perceived competence and a renewed perspective ($r = .36$), while a strong negative correlation was observed between perceived competence and return concerns ($r = -.54$). Perceived competence was weakly and positively correlated to task-approach (TAp) goals ($r = .30$; $p < .01$), whereas null findings were observed for the relationships between perceived competence and the other five goals. TAp goals were moderately and positively correlated to a renewed perspective ($r = .44$; $p < .01$) and weakly and negatively correlated to return concerns ($r = -.22$; $p < .05$). Other-approach (OAp) goals were weakly and positively correlated to a renewed perspective ($r = .28$; $p < .05$) and weakly and negatively correlated to return concerns ($r = -.24$; $p < .05$). No other significant correlations between achievement goals and return-to-sport outcomes were observed. A renewed perspective was moderately and negatively correlated to return concerns ($r = -.39$; $p < .01$). Weak to strong correlations emerged among the six achievement goals ($r = .15$ to $r = .74$).

Mediation analysis

Based on the correlation matrix, task-approach goals were the only goals significantly correlated to the antecedent (i.e., perceived competence) and the two return-to-sport outcomes (i.e., renewed perspective and return concerns). Since achievement goals are orthogonal, five interaction terms were made in order to test whether a combination of goals would mediate the relationship between perceived competence and return-to-sport outcomes. The interaction terms (i.e., TAp x SAp, TAv x SAv, TAv x

OAv, SAp x OAp, and SAv x OAv) were created based on significant correlations ($r \geq .45$; $p < .01$) between goals. No significant relationships were observed between any interaction terms and either of the return-to-sport outcomes. Thus, only two mediation analyses were conducted with *perceived competence* entered as the independent variable and *task-approach goals* as the mediator variable for both analyses. The dependent variable for the first analysis was a *renewed perspective*, while the dependent variable for the second analysis was *return concerns*. A significant mediation effect can be concluded if the indirect effect (a-path*b-path) is significant. In order to test the significance of the indirect effect, the SPSS macro PROCESS (Hayes, 2013) was used to determine bootstrapped confidence intervals. As seen in Figure 2, the results of the first mediation analysis showed that there was a significant indirect effect of perceived competence on a renewed perspective through the adoption of task-approach goals, ab = 0.1483, BCa CI [0.0476, 0.3045]. The mediator accounted for 31% of the total effect, P_M = .314. The R^2 mediation effect size was .075, indicating that roughly 7.5% of the variance in a renewed perspective could be explained by the mediation model. The second mediation analysis with perceived competence, task-approach goals, and return concerns was not significant (ab = -0.0416, BCa CI [-0.1781, 0.0674]).

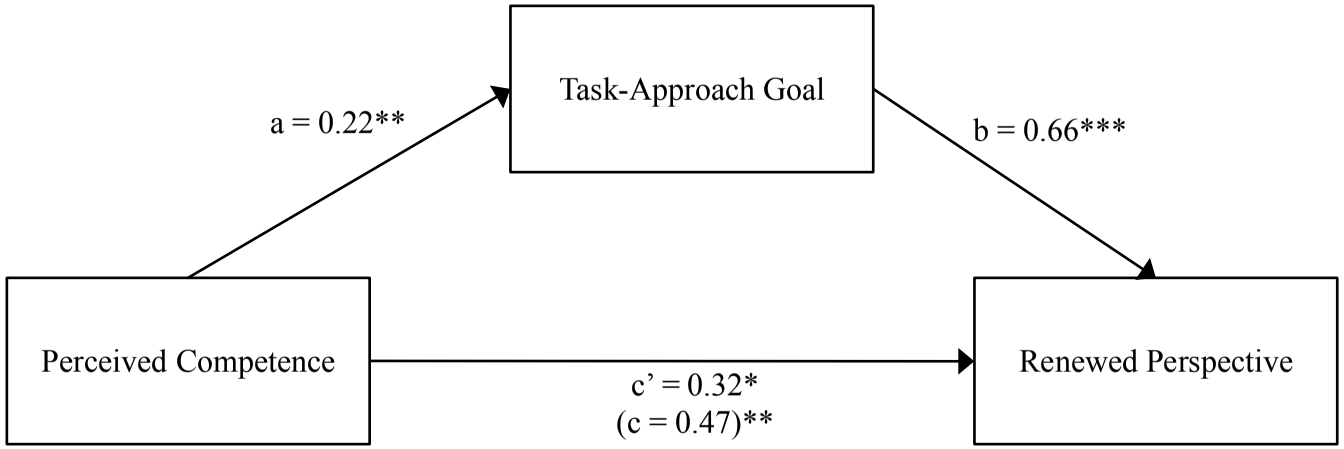

Figure 2. Mediation Analysis Predicting a Renewed Perspective *$p < .05$ **$p < .01$ ***$p < .001$

DISCUSSION

Grounded in the hierarchical model of achievement motivation (Elliot & Church, 1997), the present study tested a theoretically based model examining the hypothesized relationships between achievement goals, perceived competence, and return-to-sport outcomes in the context of sport injury. The purpose of this study was to examine whether achievement goals mediated the relationship between perceived competence and return-to-sport outcomes among formerly injured collegiate athletes. The findings indicated some support for the hypothesis that achievement goals would mediate the relationship between perceived competence and return-to-sport outcomes. Although there were no other significant mediation analyses, the results showed that task-approach goals partially mediated the relationship between perceived competence and a renewed sport perspective. These findings suggest that athletes who believe themselves to be capable and proficient in their sport will be driven by goals to perform well, to be effective, and to obtain good results. These goals, in turn, facilitate the perception of beneficial outcomes such as greater enjoyment, mental toughness, and motivation for sports success. Since the significance of a mediation analysis is determined by the indirect effect (i.e., a-path*b-path), the significant paths from antecedents to goals (i.e., "a-path") as well as from goals to outcomes (i.e., "b-path") in the current study will be discussed along with other significant findings.

The first step regarding the aim to assess whether there was a significant

mediating effect of achievement goals on perceived competence and return-to-sport outcomes was to examine the "a-path." Perceived competence (i.e., the antecedent) was positively associated with task-approach goals. These results indicated a significant "a-path" from perceived competence to task-approach goals, which is consistent with previous research demonstrating that high perceptions of competence positively predict approach goals (Gucciardi, 2010; Morris & Kavussanu, 2009; Nien & Duda, 2008). This makes intuitive and conceptual sense given that when individuals believe they are proficient and capable, they will likely be motivated to demonstrate that competence in achievement settings and be directed by the possible positive outcomes of their efforts (Elliot & Covington, 2001). More specific to the 3x2 model, the results of the current study are similar to those of Mascret and colleagues (2015) who found that perceived competence was positively related to task-approach and other-approach goals but unrelated to self-approach goals. An interpretation of the null results between perceived competence and SAp goals may be that athletes with high and low perceptions of competence alike strive for improvement (SAp) (Mascret et al., 2015).

The second step in exploring potential mediating effects was to examine the "b-path." We offered no directional hypothesis concerning the relationship between achievement goals and return-to-sport outcomes. Although we suggested that avoidance goals may be adaptive among injured athletes because they could lead to athletes taking precautions to avoid aggravating their injury, no significant relationships were found between avoidance goals and either return-to-sport outcomes. On the other hand, both task- and other-approach goals were positively associated with a renewed perspective and negatively associated with return concerns. The only significant mediation analysis,

however, was that which included task-approach goals and a renewed perspective. The results of the significant "b-path" from task-approach goals to a renewed perspective are consistent with previous research that found approach goals to positively predict adaptive outcomes such as enjoyment, motivation, and performance (Adie & Jowett, 2010; Bois, Sarrazin, Southon, & Boiché, 2009; Conroy, Kaye, & Coatsworth, 2006; Li et al., 2011; Morris & Kavussanu, 2009; Stoeber & Crombie, 2010). Within the 3x2 model, task-approach goals have been shown to positively predict intrinsic interest among a sample of French college club sport athletes (Mascret et al., 2015). Task-approach goals thus appear to be equally facilitative for athletes returning from sports injury as for all athletes. Coaches, athletic trainers, teammates, and significant others could encourage the adoption of task-approach goals among returning athletes by emphasizing effort, task-completion, correct form, and consistency as well as by de-emphasizing comparisons to others (i.e., OAp/OAv goals), comparison to their preinjury selves, or to their potential had they not sustained an injury (i.e., SAp/SAv goals). Such comparisons could be detrimental to athletes' motivation and enjoyment should they fail to "match up."

It is interesting to explore potential explanations for why none of the avoidance goals predicted either return-to-sport outcome. In their review, Van Yperen, Blaga, and Postmes (2014) suggested that given the inherent social comparison and competitiveness of sport, individuals adopting performance-avoidance goals in the sport domain—as opposed to the work or education domains—may not experience a lack of focus, effort, or persistence. Similarly, among athletes returning to sport after injury, avoidance goals may not denote a negative connotation because not being worse than you were before (SAv), not being worse than others (OAv), or not being ineffective (TAv) may be

regarded positively, especially given the setbacks of injury. Thus, one can appreciate how avoidance goals may be interpreted as neutral, as opposed to detrimental, in terms of predicting return-to-sport outcomes among injured athletes. Elliot and Conroy (2005) warn, however, that avoiding a negative outcomes is an inherently aversive form of regulation so even when seemingly benign or facilitative in the short-term, avoidance goals are likely associated with long-term adverse effects such as negative affect, undermined intrinsic motivation, and deteriorated performance.

Our second hypothesis that perceived competence would positively predict a renewed perspective and negatively predict return concerns was supported. These findings make intuitive sense given that high perceptions of sport ability would be positively associated with greater enjoyment, mental toughness, and sport proficiency and inversely related to low confidence, anxiety, and poor performance. In their study of high-level adult athletes who returned to sport from an injury, Podlog, Lochbaum, and Stevens (2010) found that competence significantly and positively predicted a renewed perspective, but failed to negatively predict return concerns. Overall, these results highlight the importance of taking steps during rehabilitation to ensure athletes perceive themselves to be capable of meeting the physical and psychological demands of their sport prior to making their return to practice and/or competition. Such steps may include progressive physical tests assessing functionality and sport-specific skills/abilities as well as psychological interventions such as relaxation, imagery, self-talk, attentional focus, and emotional control.

Other notable findings include the consistently high means for each achievement goal, the greater mean reported for renewed perspective than return concerns, and the

unique predictive profiles of task- and self-referenced goals.

The higher reports of experiencing a renewed perspective than of return concerns after injury is consistent with previous research (Podlog & Eklund, 2005). This is a positive finding indicating that although injury is a negative event, many athletes are able to recognize injury as an opportunity for psychological growth. Additionally, the negative correlation between return concerns and a renewed perspective suggests that the two factors are accounting for different psychological outcomes (i.e., positive and negative) associated with a return to sport after injury and provides additional support for the RSSIQ (Podlog & Eklund, 2005).

The bifurcation of mastery-approach goals from the 2x2 achievement goal model resulted in task-approach, but not self-approach, goals significantly predicting return-to-sport outcomes. This finding provides support of the 3x2 achievement goal model and is in accord with Mascret and colleagues' (2015) position that an exhaustive cross of both the definition and valence of competence allows for greater precision and rigor in explaining the nature of achievement motivation in the sport domain. The differentiation of task- and self-based standards is conceptually relevant to the domain of sport injury because individuals may focus on whether they are (or are not) accomplishing the task (TAp/TAv) or alternatively, they may focus on how they are doing relative to how they have done in the past (preinjury) or how they may do in the future (SAp/SAv). Although this study provided partial support of the relevance of the 3x2 model in the context of sport injury, additional research is needed to gain a more extensive understanding of the unique antecedents and outcomes of each achievement goal.

Limitations and future directions

The present study was the first to explore the utility of the 3x2 model of achievement goal theory and the hierarchical model of achievement motivation in the context of sport injury. Although the findings have practical implications and contribute to the literature on achievement motivation, sport, and sport injury, there are a number of limitations to be discussed. First, the small sample size and cross-sectional design of the study limit the generalizability of the findings and the ability to determine causality. The nature of sport injury research makes it difficult to recruit large homogenous samples, but future research would benefit by controlling for injury type and time loss.

Additionally, the retrospective design can be criticized for increasing the likelihood for memory decay and recall bias. The present study tried to minimize this limitation by introducing a 2-year criterion within which athletes must have returned to their sport after injury. One strength of using a retrospective design for this study, however, was that it permitted athletes to reflect on their overall injury experience and to ascertain the outcomes of their injury. Future research could implement a longitudinal design, which would minimize memory biases but still allow athletes to look back on their perceived outcomes. A longitudinal design would also provide the opportunity to follow injured athletes who never return to sport and explore whether their perceptions of competence and achievement goals contribute to that outcome.

Due to both the independent and dependent variables being assessed solely through self-report measures, another limitation of this study is shared method variance. Future research can use additional measures including objective measures of performance and informant reports from coaches, athletic trainers, teammates, and significant others to

assess return-to-sport outcomes.

A final limitation is directed towards the 3x2 AGQ-S. Although the measure has made significant improvements upon prior achievement goal measures by utilizing only goal-relevant language consistent with AGT, the task-referenced items are vague and thus may not be valid in their measurements of task-approach and task-avoidance goals. Task-approach goals in the current study had a mean of 6.22 and a narrow range of 5.00-7.00 on a 7-point scale, which calls for some suspicion. Additionally, Mascret and colleagues (2015) also found a high mean of 6.08 for task-approach goals. Consistent with the suggestion of Mascret and colleagues (2015), future research using the 3x2 AGQ-S would do well to sample athletes from the same sport so that the task-referenced items may be better tailored to sport-relevant tasks.

In conclusion, the findings of this study indicate a promising avenue for future research regarding the use of Elliot's hierarchical model of approach and avoidance achievement motivation in revealing connections between existing research on psychosocial factors associated with sport injury and return-to-sport outcomes. Such research may inform practice on possible interventions targeted at modifying achievement goals and their antecedents in an effort to improve injured athletes' return-to-sport experiences. To reiterate the practical implications from the results of the present study, coaches and significant others may do well to use language that orients athletes towards attaining success as opposed to avoiding failure, to emphasize effort, task completion, and correct form, and to avoid comments that compare athletes to others or to their preinjury standards of performance.

APPENDIX A

EXTENDED LITERATURE REVIEW

Introduction

Sport injury is both a physical and psychological event (Bianco, Malo, & Orlick, 1999). While the physical consequences are self-evident, the profound psychological impact of injury on competitive athletes is now well documented (e.g., Bianco, 2001; Johnston & Carroll, 1998; Podlog, Dimmock, & Miller, 2011; Wadey, Evans, Hanton, & Neil, 2012). Psychological factors associated with sport injury such as motivation, fear, confidence, and anxiety may positively or negatively influence athletes' experiences throughout the various phases of sport injury recovery. An increasing area of interest is exploring the psychosocial factors influencing athletes' return to sport following injury rehabilitation (Ardern, Taylor, Feller, & Webster, 2013).

Researchers have recognized that physical and psychological recovery from injury are not synonymous and do not necessarily occur simultaneously (Podlog & Eklund, 2006). Consequently, despite the fact that athletes may have completed their rehabilitation and are physically cleared to return to regular training and competition, they may not be psychologically ready (Bianco et al., 1999; Gould, Udry, Bridges, & Beck, 1997; Podlog, Heil, & Schulte, 2014; Wadey et al., 2014). Although some athletes appraise the return positively as an opportunity to train and compete again, others face

debilitating apprehension and concerns about their return to sport (Clement, Arvinen-Barrow, & Fetty, 2015; Podlog & Eklund, 2006). Moreover, psychological factors such as motivation (Podlog & Eklund, 2005; Wadey et al., 2012), confidence (Johnston & Carroll, 1998), fear of re-injury (Bianco et al., 1999; Lentz et al., 2015; Te Wierike, Van Der Sluis, Van Den Akker-Scheek, Elferink-Gemser, & Visscher, 2013; Tripp, Stanish, Ebel-Lam, Brewer, & Birchard, 2011), and hardiness (Wadey et al., 2012) have been shown to influence the types of outcomes athletes experience following their return to sport from injury. Both positive outcomes, such as improved performance and psychosocial growth, as well as maladaptive outcomes, such as decrements in performance perceptions and well-being, have been shown to occur (Podlog, Lochbaum, & Stevens, 2010).

The aim of this review is to a) examine injured athletes' appraisals and emotions prior to their re-entry into the competitive arena b) examine research highlighting various return-to-sport outcomes following a return to sport from injury, and c) examine the relevance of achievement goal theory (AGT), specifically Elliot's hierarchical model of approach and avoidance achievement motivation, as a framework for examining the psychology of a return to sport following injury. Finally, limitations of previous injury research and future research examining the return to sport using the hierarchical model are discussed. It is worth noting that this review is not intended to be exhaustive in examining all of the psychology of sport injury (injury antecedents, responses to injury, factors influencing rehabilitation) or achievement goal literatures, both of which have been reviewed extensively elsewhere (e.g., Ardern et al., 2013; Lochbaum & Gottardy, 2014; Lochbaum, Jean-Noel, Pinar, & Gilson, in press; Podlog et al., 2011; Podlog &

Eklund, 2007; Van Yperen, Blaga, & Postmes, 2014). Rather, the aim is to synthesize research examining the psychology of a return to sport from injury in order to demonstrate conceptual overlaps with Elliot's hierarchical model of approach and avoidance achievement motivation. Findings from this review not only have the potential to inform the development of future research in this area but have practical implications as well. For instance, coaches, athletic trainers, and sport psychology consultants could gain valuable information on how to structure the environment surrounding injured athletes in such a way to provide athletes the best chance of experiencing a positive return-to-sport. This review could inform practitioners on precautions and interventions to be implemented during recovery and the initial return from injury to aid in facilitating the most adaptive and positive sport injury outcomes.

Athlete appraisals and emotions regarding a return to sport following injury

Negatively valenced appraisals and emotions. Sustaining an injury can be a very traumatic, frustrating, and disconcerting experience (Podlog et al., 2010). Negative emotional responses such as denial, anxiety, depression, anger, and hopelessness are common among injured athletes (Bauman, 2005). These emotions are typically strongest in the days immediately following the injury occurrence and diminish throughout the rehabilitation phase; however, elevated negative cognitive and emotional responses during the return-to-sport phase have been documented (Podlog & Eklund, 2007).

After having sustained an injury and consequently having lost valuable time training and competing, athletes may experience doubts in their ability to adequately meet the demands of their sport (Clement, Arvinen-Barrow, & Fetty, 2015; Gould et al.,

1997). The most commonly reported concern pertains to fears of reinjury (e.g., Bianco, 2001; Clement et al., 2015; Gould et al., 1997; Johnston & Carroll, 1998; Podlog & Eklund, 2006; Podlog, Kleinert, Dimmock, Miller, & Shipherd, 2012). These fears are often on account of low confidence in the injured body part to withstand the physical challenges of sport (Kvist, Ek, Sporrstedt, & Good, 2005).

Another return concern pertains to athletes' abilities to perform to preinjury standards (Podlog et al., 2011; Podlog & Eklund, 2007; Podlog et al., 2013). More specifically, athletes may worry about regaining their technical skills and abilities, recovering their fitness levels, losing their spot on the team, and falling behind competitors (Tracey, 2003). Moreover, some athletes may fear that having to wear additional protective gear such as a knee brace could affect their ability to perform (Bianco, 2001). Apart from meeting preinjury standards of performance, athletes may face uncertainties about their ability to exceed their previous levels of performance and achieve the same aspirations they had before the injury (Bianco, 2001; Johnston & Carroll, 1998; Podlog & Eklund, 2006).

A final return concern includes self-presentational concerns about appearing unfit, incapable, or lacking in skill compared to others (Podlog et al., 2011). Athletes may be worried about not letting down others or falling short of expectations (Podlog & Eklund, 2006). Overall, athletes may be concerned about their ability to uphold their reputation and maintain an impression of athletic competence (Podlog & Eklund, 2006). Scholars have suggested that all the negative appraisals and emotions described above relate to athletes' perceptions of competence, which can be characterized as a sense of proficiency or effectiveness in one's endeavors (Podlog & Eklund, 2007).

Positively valenced appraisals and emotions. In addition to the negative cognitive appraisals during the return-to-sport phase, many athletes experience positive cognitive appraisals at this time (Clement et al., 2015; Podlog & Eklund, 2005, 2006). After having been restricted in their activities while recovering from injury, athletes may be eager to return to sport. A number of qualitative studies have revealed that athletes experience excitement and anticipation about demonstrating their competence, or athletic proficiency, upon receiving clearance to return to sport (Podlog et al., 2012; Podlog et al., 2013; Tracey, 2003; Wadey et al., 2012). Athletes may view their return as an opportunity to attain personal goals such as regaining preinjury performance levels, improving skills, maintaining fitness levels, achieving personal bests, and preserving athletic identity (Podlog & Eklund, 2006).

Return-to-sport outcomes following injury rehabilitation

Positive outcomes. Although injury in and of itself is undoubtedly a negative event, research on the return-to-sport phase has revealed that the chaos and disruption of injury has the potential to induce a vast number of positive outcomes. Udry, Gould, Bridges, and Beck (1997) divided these 'benefits' of injuries into three categories: 1) personal growth benefits, 2) psychologically based performance enhancements, and 3) physical/technical benefits. This review will utilize those categories to organize the perceived benefits represented in the literature exploring athletes' experiences upon returning to sport following injury.

Many athletes returning to sport after injury describe having gained a new perspective (Clement et al., 2015). This new or renewed perspective may stem from an

appreciation of the importance of sport in their lives (Podlog & Eklund, 2006), an appreciation of their health (Tracey, 2003), or from having the opportunity to take a closer look at their lives overall (Udry et al., 1997). Athletes reported that due to their injury, they were able to develop aspects of their lives apart from sport such as building or maintaining relationships, focusing on school, finding new hobbies, and discovering possible career paths (Udry et al., 1997). Along with gaining perspective, injury facilitated greater maturity, independence, positive thinking, and empathy towards other injured athletes (Podlog et al., 2012; Udry et al., 1997; Wadey, Evans, Evans, & Mitchell, 2011). Athletes also learned more about themselves, their inner strength and commitment, and their ability to regulate their emotions (Podlog & Eklund, 2006; Tracey, 2003; Wadey, Clark, Podlog, & McCullough, 2013; Wadey et al., 2011).

The primary psychological benefit reported is that of increased mental toughness (Podlog & Eklund, 2006, 2009; Podlog et al., 2013; Tracey, 2003). This feeling of increased mental toughness may be attributed to a greater tolerance for pain, increased awareness of how to achieve one's goals, greater ambition and motivation, as well as an enhanced sense of confidence and self-efficacy (Podlog & Eklund, 2006; Udry et al., 1997). Athletes also discussed gaining strength and resilience after having dealt with adversity (Clement et al., 2015; Podlog & Eklund, 2006; Podlog et al., 2012; Podlog et al., 2013; Wadey et al., 2011). A final psychological benefit following injury comes with understanding what expectations or goals are realistic (Podlog, Hannon, Banham, & Wadey, 2015). Unrealistic goals may set the athletes up for failure, which would undermine their motivation, self-confidence, enjoyment, and ultimately, their performance. Realistic goals and expectations, on the other hand, set athletes up for

success, thus enhancing their motivation and confidence, which aid in facilitating good performance.

In addition to personal and psychological growth, injury provides many opportunities to become more proficient in one's sport and learn more about one's body. Injured athletes are able to observe and analyze their sport from a different view; this can lead to technical and tactical refinement upon their return (Podlog & Eklund, 2006; Udry et al., 1997; Wadey et al., 2011). Athletes may also be exposed to new methods of training and conditioning and thus experience improvements in physical strength and fitness from pre- to postinjury (Podlog & Eklund, 2006; Udry et al., 1997; Wadey et al., 2013; Wadey et al., 2011). Throughout their recovery, athletes may gain an increased knowledge of risk factors of injury as well as of injury prevention strategies (Podlog et al., 2013; Wadey et al., 2013; Wadey et al., 2011). In addition, athletes may learn more about their anatomy, their physical limits, and their bodies' responses to pain and training (Udry et al., 1997; Wadey et al., 2011). Ultimately, the social, psychological, and physical benefits of injury can facilitate superior performances upon athletes' return to sport (Podlog et al., 2013).

Maladaptive outcomes. Although there is the potential to experience many positive return-to-sport outcomes after injury, there are, unfortunately, also a number of possible negative outcomes. One of the most common negative return-to-sport outcomes is competing with apprehension and hesitation (Clement et al., 2015; Johnston & Carroll, 1998; Podlog & Eklund, 2006; Podlog et al., 2012; Podlog et al., 2013; Tracey, 2003). For fear of reinjury, athletes may hold back or not give 100% effort especially when encountering the same situation in which the initial injury was sustained (Johnston &

Carroll, 1998). Athletes returning to sport after injury may also experience increased performance anxiety (Bianco et al., 1999; Johnston & Carroll, 1998; Podlog & Eklund, 2006) and lower levels of confidence (Evans, Hardy, & Fleming, 2000; Johnston & Carroll, 1998; Podlog & Eklund, 2006, 2007; Podlog et al., 2012). Furthermore, athletes may perceive diminished postinjury performances (Kvist et al., 2005). A final negative outcome is reinjury, potentially due to the physiological and psychological changes (e.g., muscle tension and increased distractibility) that occur in response to a fear of injury (Podlog et al., 2014; Podlog et al., 2012).

The preceding research has shown that questions of competence may be at the forefront of athletes' minds as the return to sport draws near. Furthermore, research on appraisals of an upcoming return suggests that athletes may be motivated to approach demonstrating competence and to avoid demonstrating incompetence. Finally, evidence of both adaptive and maladaptive return-to-sport outcomes highlights the need to better understand the psychosocial factors that facilitate—versus mitigate—the likelihood of optimal return to sport outcomes. Towards this end, adopting a relevant theoretical framework is of evident value. One such framework is achievement goal theory (AGT; Nicholls, 1984).

Achievement goal theory and the return-to sport following injury

The aim of this section is to a) highlight the tenets of AGT, b) discuss Andrew Elliot's hierarchical model that builds upon AGT, and c) to examine conceptual overlap between the hierarchical model and research findings on the return to sport from injury.

Achievement goal theory. Achievement goal theory (Nicholls, 1984) has been a

prominent theory of achievement motivation over the last 30 years. According to AGT, an achievement goal is conceptualized as the purpose or aim of competence-based action (Elliot & Conroy, 2005) and is posited to regulate how individuals interpret, experience, and act in achievement settings (Elliot & Church, 1997). An earlier variation of the theory offers a dichotomous framework, which distinguishes between performance goals (focused on demonstrating normative competence) and mastery goals (focused on developing competence or task-mastery) (Elliot, 1999). It was hypothesized that striving for improvement relative to individuals' previous performances or the task itself (i.e., mastery) would lead to more adaptive outcomes whereas striving to outperform others (i.e., performance) would result in a set of maladaptive outcomes (Elliot & Conroy, 2005). However, equivocal results regarding the consequences of pursuing performance goals led to further investigations.

Elliot and Harackiewicz (1996) looked to whether the approach/avoidance distinction could account for the null or even positive outcomes found after adopting performance goals in achievement settings. The distinction between approach and avoidance tendencies is of distant origin and of vast application; Greek philosophers in 400 B.C.E called it ethical hedonism in which human behavior is guided by the pursuit of pleasure or by the avoidance of pain (Elliot & Covington, 2001). Simply put, approach motivation is when behavior is directed by a positive/desirable event or possibility. Conversely, avoidance motivation is directed by a desire or interest to avoid a negative/undesirable event or possibility (Elliot & Covington, 2001).

When the approach/avoidance distinction was integrated with AGT to form the trichotomous framework, the three resulting goals were mastery, performance-approach,

and performance-avoidance (Elliot & Harackiewicz, 1996). Performance-approach goals were conceptualized as being focused on attaining normative competence whereas performance-avoidance goals are focused on avoiding normative incompetence (Elliot & Harackiewicz, 1996). Subsequent research supports the separation of performance-approach and performance-avoidance goals and revealed that the majority of the deleterious consequences of performance goals could be attributed to the adoption of performance-avoidance goals (Elliot & Conroy, 2005).

However, in order to account for the broad spectrum of competence-based strivings, Elliot (1999) and Pintrich (2000) proposed a full crossing of the performance/mastery and approach/avoidance distinctions, which led to the 2x2 model of AGT (Elliot & McGregor, 2001). In the dichotomous and trichotomous models, mastery goals are viewed as being exclusively approach. The 2x2 framework thus introduced mastery-avoidance goals, which are focused on avoiding self- or task-referenced incompetence (Elliot & Conroy, 2005). Although the practical significance of mastery-avoidance goals has been called into question, these goals appear to be particularly salient among several cohorts such as perfectionists, who do not want to make any mistakes or forget any information; aging populations, who are at risk of physical and cognitive deteriorations; athletes reaching their peak performance capabilities; and lastly, athletes returning to competition following serious injury who may strive to avoid coming back worse than they were prior to their injury. Providing further support for the 2x2 model, research has found each of the four goals to predict a distinct pattern of achievement-relevant processes and outcomes (Elliot & McGregor, 2001; Nien & Duda, 2008).

Mastery-approach (MAp) goals are theoretically the most adaptive achievement

goal and in sport have been shown to positively predict beneficial outcomes such as intrinsic motivation and enjoyment (Adie & Jowett, 2010; Conroy, Kaye, & Coatsworth, 2006; Jaakkola, Ntoumanis, & Liukkonen, 2016; Li et al., 2011; Morris & Kavussanu, 2009; Nien & Duda, 2008; Puente-Diaz, 2012, 2013; Trenz, & Zusho, 2011), positive affect (Adie, Duda, & Ntoumanis, 2008, 2010; Nicholls, Perry, & Calmeiro, 2014), well-being (Adie, Duda, & Ntoumanis, 2008, 2010; Li, 2010), and performance (Li, 2010; Li et al., 2011; Lochbaum & Gottardy, 2014; Lochbaum & Smith, 2015; Puente-Díaz, 2012; Stoeber & Crombie, 2010; Vallerand et al., 2008);. In addition, MAp goals have been shown to negatively predict maladaptive outcomes such as self-handicapping (Kavussanu, Morris, & Ring, 2009; Ntoumanis, Thøgersen-Ntoumani, & Smith, 2009), anxiety (Li, 2013), and externally regulated forms of motivation as well as amotivation (Conroy, Kaye, & Coatsworth, 2006; Nien & Duda, 2008).

Mastery-avoidance (MAv) goals are believed to have a more maladaptive pattern of consequences than MAp goals but a more adaptive pattern than performance-avoidance goals (Elliot & McGregor, 2001). In the sport literature, MAv goals have been found to positively predict maladaptive outcomes including amotivation (Conroy et al., 2006; Nien & Duda, 2008), threat appraisals (Adie et al., 2008; Nicholls, Perry, & Calmeiro, 2014), low self-esteem (Adie et al., 2008; Isoard-Gautheur, Guillet-Descas, & Duda, 2013), anxiety (Li, 2013; Morris & Kavussanu, 2009; Stenling, Hassmén, & Holmström, 2014), and negative affect (Adie et al., 2008; Schantz & Conroy, 2009), as well as negatively predict adaptive outcomes such as well-being (Adie et al., 2008, 2010) and intrinsic motivation (Conroy, Kaye, & Coatsworth, 2006).

Performance-approach (PAp) goals reveal an assortment of adaptive and

maladaptive outcomes. Adaptive outcomes from adopting PAp goals include enhanced self-confidence (Cetinkalp, 2012; Stoeber & Crombie, 2010), well-being (Li, 2010), and performance (Bois, Sarrazin, Southon, & Boiché, 2009; Halvari & Kjørmo, 1999; Lochbaum & Gottardy, 2014; Stoeber & Crombie, 2010; Stoeber, Uphill, & Hotham, 2009). On the other hand, examples of maladaptive outcomes predicted by performance-approach goals in sport are threat appraisals (Adie et al., 2008), self-handicapping (Kavussanu et al., 2009), emotional and physical exhaustion (Isoard-Gautheur et al., 2013), and negative reactions to imperfection (Stoeber, Stoll, Pescheck, & Otto, 2008).

Performance-avoidance (PAv) goals are conceptualized as the most maladaptive achievement goal. In sport, PAv goals have been shown to positively predict maladaptive outcomes including anxiety (Li, 2013; Morris & Kavussanu, 2009; Stenling et al., 2014), threat appraisals (Nicholls et al., 2014), self-handicapping (Ntoumanis et al., 2009), amotivation (Nien & Duda, 2008), and negative reactions to imperfection (Stoeber et al., 2008). Additionally, PAv goals have been negatively associated with adaptive outcomes such as challenge appraisals (Adie et al., 2008), health and well-being (Lench, Levine, & Roe, 2010; Li, 2010), and performance (Halvari & Kjørmo, 1999; Li, 2010; Li et al., 2011; Stoeber et al., 2009; Vallerand et al., 2008).

Although the 2x2 model is deemed appropriate and sufficient in may achievement settings, the most comprehensive expansion of achievement goal theory accounts for instances where distinguishing mastery goals into task- and self-based categories would provide further clarity (Elliot et al., 2011). In this 3x2 model, the *definition* of competence (task/self/other) is fully crossed with the *valence* of competence (approach/avoidance) to produce six goals: task-approach (focused on attaining task-

based competence), task-avoidance (focused on avoiding task-based incompetence), self-approach (focused on attaining self-based competence), self-avoidance (focused on avoiding self-based incompetence), other-approach (focused on attaining other-based competence), and other-avoidance (focused on avoiding other-based incompetence) (see Figure 1; Mascret et al., 2015). It is important to note that these goals are orthogonal in nature. In other words, they are independent of each other. Therefore, an individual may have an achievement goal profile characterized as being simultaneously high or low in any or all of the six achievement goals.

Conceptual support of the 3x2 model as outlined by Mascret and colleagues (2015), follows that the differentiation of task- and self-based standards is clearly relevant in the sport domain given that in any sport activity or physical task, individuals may focus on whether they are (or are not) accomplishing the task, on how they are doing relative to how they have done in the past or how they may do in the future, and/or lastly on how they are doing relative to others. The authors concluded that utilizing the exhaustive cross of both the definition and valence of competence allows for greater precision and rigor in explaining the nature of achievement motivation in the sport domain (Mascret et al., 2015).

Furthermore, existing empirical evidence demonstrates support for the 3x2 model. When compared to all other alternative achievement goal models, the 3x2 model provided the best fit to the data; in addition, each goal was found to have a distinct profile of antecedents and consequences (Elliot et al., 2011; Mascret et al., 2015). Elliot and his colleagues (2011) found that among students in an undergraduate psychology class, task approach goals were positively associated with intrinsic motivation, learning efficacy,

and absorption in class; task-avoidance were not significantly related to any of the tested variables; self-approach goals were positively related to energy in class; self-avoidance goals were negatively associated with energy in class; other-approach goals were positively associated with exam performance and learning efficacy; and other-avoidance goals were negatively associated with exam performance and learning efficacy and positively associated with worry about exams. In his study of athletes at a French university, Mascret and colleagues (2015) found that perceived competence positively predicted task-approach and other-approach goals, that intrinsic interest was positively related to task-approach and self-approach goals, and that for implicit theories of ability, incremental theory positively predicted task-approach and self-approach goals while entity theory positively predicted other-approach and other-avoidance goals.

Although there is currently no research explicitly exploring the 3x2 model in relation to the return from sport injury, a number of qualitative studies have gathered data from injured athletes describing at least one of the six achievement goals in the 3x2 model in relation to their return to sport. For instance, Driediger, Hall, and Callow (2006) recorded an injured wrestler who said that he "wanted to get back and beat [his competition]" (p. 265). This would be an example of an other-approach goal because it uses an interpersonal standard (i.e., his competition) and is focused on success or moving towards a positive possibility (i.e., winning) (Elliot et al., 2011). Another athlete described his motivation to return to sport saying, "I imagine myself at practice and completely sucking… or being horrible, or out of shape and I don't want that to happen" (Driediger et al., 2006, p. 267). This athlete could be characterized as being motivated by a task-avoidance goal because he is focused on avoiding being ineffective or performing

poorly (Elliot et al., 2011). In Podlog and Eklund's (2009) qualitative study investigating high level athletes' perceptions of success in returning to sport following injury, the authors noted that athletes can be motivated to feel as though they are contributing to the team's success as well as to receive positive feedback from coaches (p. 540). In other words, athletes may focus on accomplishing what the task requires of them rather than comparing their performance to that of others or to their own past performances or potential. This would be an example of injured athletes who are motivated to pursue task-approach goals (Elliot et al., 2011). Additionally, research has shown that injured athletes returning to sport may be motivated to avoid losing to competitors they used to beat or to avoid losing their spot on the team to a teammate (i.e., other-avoidance); that they may be motivated to beat their preinjury performance accomplishments or reach performance goals they had set for themselves before the injury (i.e., self-approach); and lastly, that they may be focused on self-based incompetence and thus be motivated to avoid doing worse than they did prior to sustaining their injury (i.e., self-avoidance) (Mascret et al., 2015; Podlog & Eklund, 2006).

Elliot's hierarchical model of approach and avoidance achievement motivation. While achievement goal theory addresses the goals one may or may not pursue in particular achievement contexts or situations, Elliot's hierarchical model of approach and avoidance achievement motivation addresses the bigger picture by incorporating antecedents and consequences to achievement goals (see Figure A1; Elliot, Sheldon, & Church, 1997). Within the hierarchical model, antecedents are posited to indirectly modify achievement behavior and outcomes by way of achievement goal adoption (Cury, Da Fonséca, & Rufo, 2002; Elliot, 1999; Elliot & Church, 1997). The

terms antecedents and consequences according to this model are used to communicate the proposed nature of the relationships between variables and are not meant to imply causality (Elliot et al., 2011). In other words, these antecedents influence goal adoption, which influences how individuals interpret, experience, or act in achievement settings.

Examples of antecedents outlined in Elliot's hierarchical model include perceived competence, motive dispositions (i.e., need to achieve and fear of failure), implicit theories of ability (i.e., entity and incremental), perceptions of motivational climate, and environmental or personal factors (Elliot & Church, 1997). In the sports literature utilizing the goals from the 2x2 model, antecedents of mastery-approach goals include perceived competence (Morris & Kavussanu, 2008; Nien & Duda, 2008), mastery climates (Morris & Kavussanu, 2008; Skjesol & Halvari, 2005; Trenz & Zusho, 2011); and incremental beliefs of ability (Stenling et al., 2014). Mastery avoidance goals have been negatively predicted by perceived competence (Isoard-Gautheur et al., 2013) and mastery climates (Trenz & Zusho, 2011) as well as positively predicted by fear of failure (Conroy & Elliot, 2004) and performance climates (Isoard-Gautheur et al., 2013). Antecedents of performance-avoidance goals include entity beliefs about sport ability (Stenling, Hassmén, & Holmström, 2014), fear of failure (Conroy & Elliot, 2004; Halvari & Kjørmo, 1999; Nien & Duda, 2008), and performance climates (Morris & Kavussanu, 2008; Nien & Duda, 2008). Lastly, performance-approach goals have been predicted by fear of failure (Nien & Duda, 2008), performance climates (Morris & Kavussanu, 2008; Trenz & Zusho, 2011), and perceived competence (Morris & Kavussanu, 2008; Nien & Duda, 2008).

The hierarchical model and sport injury. Given the relevance of athletes'

perceived competence following an extended absence from sport due to injury, it seems prudent to examine perceived competence as an influential antecedent to achievement goal adoption among this population. The consequences, or achievement outcomes, of interest for injured athletes are return-to-sport outcomes. Thus, Elliot's hierarchical model provides a guide for understanding the interactions between perceptions of competence, achievement goals, and return-to-sport outcomes, which can assist in identifying the influence of certain psychological factors on injured athletes' return-to-sport experiences.

Implications and directions for future research

Findings from the psychosocial literature on sport injury have demonstrated that athletes returning to sport may have a number of competence-based appraisals, may be motivated to avoid demonstrating incompetence or demonstrating competence upon their return, and may experience a range of adaptive and maladaptive return-to-sport outcomes. Elliot's hierarchical model of approach and avoidance achievement motivation has the potential to help explain the roles of perceived competence and achievement goals in predicting return-to-sport outcomes. Research on AGT in sport has shown that being motivated to avoid failure and defining one's own competence based on comparisons to others is often detrimental to athletic performance and well-being. On the other hand, orienting goals towards the possibility of success and improvement in reference to one's self or the task often yields beneficial outcomes such as quality performances, confidence, and enjoyment.

Although there exists a plethora of literature on sport injury and much on

achievement goal theory in sport as well, research has yet to combine the two fields of study. Considering many injured athletes have undergone a certain amount of physical and psychological trauma, their perceptions of competence are likely more fragile than those of uninjured athletes. Since research has shown that high perceptions of competence positively predict approach goals and negatively predict avoidance goals, it is possible that injured athletes may be more prone to pursuing avoidance goals than uninjured athletes. Additionally, the drastic physical and psychological changes that often accompany injury may make comparisons to one's self more maladaptive among injured athletes than among uninjured athletes, especially when one is unable to or slow to regain preinjury standards of performance. Thus, research is needed to explore whether sport injury impacts what goals athletes pursue.

Furthermore, an understanding of the antecedents and consequences of the 3x2 achievement goals in the context of sport injury could inform coaches, sport psychology consultants, members of the injury rehabilitation team, and significant others on how to facilitate the best possible return-to-sport experience for injured athletes. Given that perceptions of competence are often shaken as result of sustaining an injury, it would be beneficial to explore perceived competence as an influential antecedent. Podlog and Eklund (2005) have developed the Return to Sport After Serious Injury Questionnaire (RSSIQ) to assess athletes' perceived return-to-sport outcomes. This measure would provide valuable insight on whether injured athletes perceive their return to sport positively (i.e., greater enjoyment, motivation, and mental toughness) or negatively (i.e., greater anxiety, fear of reinjury, and low confidence). Apart from self-report measures, objective measures of performance and informant reports from coaches, athletic trainers,

teammates, and significant others could be gathered to further assess return-to-sport outcomes.

Although a retrospective design would be beneficial in providing initial indications of the relationships among antecedents, achievement goals, and return-to-sport outcomes, further research would do well to adopt a longitudinal design. Longitudinal research would minimize recall biases, permit documentation of any changes in achievement goal pursuits over time, as well as allow athletes to reflect on their overall experiences. Additionally, a longitudinal design would provide the opportunity to follow injured athletes who never return to sport and determine whether certain antecedents and achievement goals could have contributed to that outcome.

Another avenue for future research would be to implement a qualitative design. Qualitative research would allow researchers to gain a more complete and accurate understanding of injured athletes' achievement goals upon their return to sport. Given that task-referenced goals are more effective and informative when sport-specific, a qualitative design would also permit researchers to tailor questions of task-referenced goals to sport-relevant tasks without limiting the sample to athletes from one sport. In addition, there is much to be gained in terms of knowledge on possible antecedents and outcomes to achievement goals through qualitative research designs, especially since no studies to date have explored AGT and Elliot's hierarchical model in the context of sport injury.

A final direction for research would be to test whether achievement goals can be modified or augmented through a manipulation of Elliot's antecedents (Elliot & Church, 1997). Interventions directed at influencing athletes' environments throughout the

rehabilitation and return-to-sport phases of injury would provide insight as to how much control one has over achievement goal adoption. For example, interventions including progressive physical tests assessing functionality and sport-specific skills/abilities as well as psychological interventions such as relaxation, imagery, self-talk, attentional focus, and emotional control could test the impact of perceived competence on achievement goal adoption. Similarly, coaches, athletic trainers, teammates, and significant others could manipulate the motivational climate through the use of language reflective of the certain goals in order to encourage the most adaptive goal adoption among athletes. For instance, should task-approach goals be the most adaptive goals among this population, an emphasis might be placed on effort, task-completion, correct form, and consistency rather than on not being worse than others or than one was before sustaining an injury.

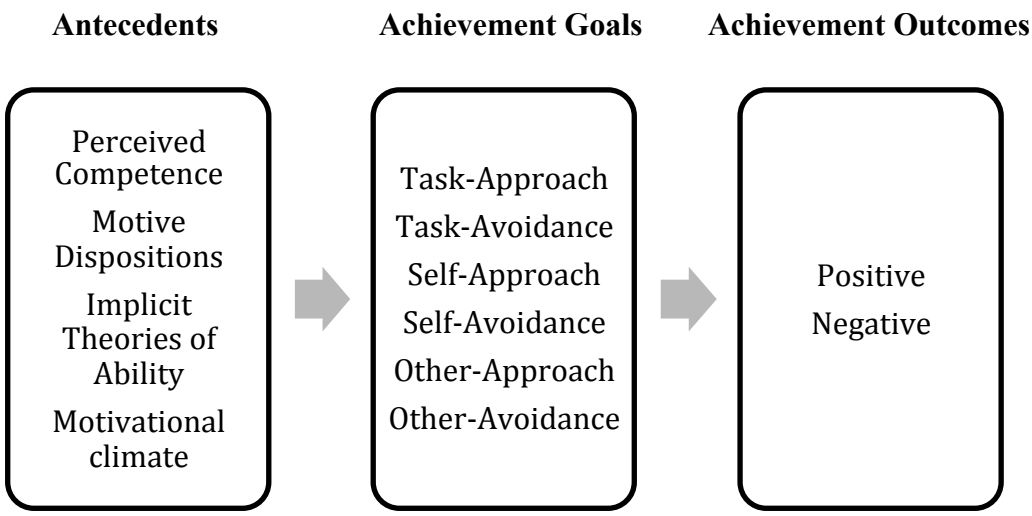

Figure A1. Elliot's hierarchical model of approach and avoidance achievement motivation. Antecedents influence achievement goals, which influence achievement outcomes (Elliot et al., 1997).

APPENDIX B

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