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Welcome to "Athletic Insight," the Journal of sport psychology. Over the past several years, both coaches and athletes have started to realize that strength, speed, and other athletic skills are not sufficient for the production of championship athletes. Athletic performance has three parts: physical preparation, technical skill, and psychological readiness. This model suggests that if any of the above areas are neglected, athletic performance will decline. However, psychological preparation is the component that is most often neglected by athletes and coaches alike.

Presently, the field of sports psychology and performance enhancement is growing exponentially. However, the sources of information related to the field are extremely limited. The purpose of this Journal is to provide a forum for discussion of topics that are relevant to the field of sport psychology through quarterly publications. The subjects covered will include theory, research, and practice of sport psychology, as well as social issues related to the field of athletics. It is our hope that this Journal will serve as a valuable resource for anyone who is interested in the field.

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THE TRANSTHEORETICAL MODEL AND
PSYCHOLOGICAL SKILLS TRAINING: APPLICATION
AND IMPLICATIONS WITH ELITE FEMALE ATHLETES

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ABSTRACT

Despite evidence of how psychological skills training (PST) can help athletic performance, some athletes still resist its use. Applying the transtheoretical model of behavior change in consultations may be helpful for decreasing resistance to PST. In the present study, questionnaires measuring stages of change, self-efficacy and processes of change towards PST were given four times to forty-five elite female rugby athletes. Individual stage scores did not change over time with the exception of precontemplation. There were no differences in stage scores between those who received sport psychology consultations and those who did not. Self-efficacy was negatively related to precontemplation scores and positively related to action scores. Those who sought individual consultations were more likely to have been in contemplation (45.5%) at the onset of the study. Further, previously identified processes of change were confirmed to be used by this population.

Keywords: transtheoretical model, psychological skills training, self-efficacy, processes of change, rugby

Reasons for neglecting or resisting psychological skills training (PST) have been explained by the stigma surrounding sport psychologists (Linder, Brewer, Van Raalte, & De Lange, 1991; Ravizza, 1988), lack of time, lack of access, low interest, and perceptions of ineffectiveness (Gould, Tammen, Murphy, & May, 1989; Zizzi & Perna, 2002). It has been suggested that a general rule of thumb when consulting with teams is that one-third will be excited about a consultant’s presence, one-third will be indifferent, and one-third will not be interested (Ravizza, 2001). At the Olympic level, 86% of 1996 Atlanta and 1998 Nagano U.S. Olympians (Greenleaf, Gould, & Dieffenbach, 2001) reported using some form of mental practice and greater PST was found to discriminate between medalists and non-medalists at the 2000 Sydney Olympic games (Taylor, Gould, & Rolo, 2008). It is unclear what percentage of athletes at other levels utilize mental

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skills. Thus, when sport psychology consultants attempt to develop, expand and increase effectiveness of consultations, the challenge exists for consultants to find effective ways to increase the use of these skills among athletes with whom they work. Applying a behavior change model to this challenge may be beneficial for active consultants. Application of a behavior change framework may prove especially helpful in team situations where there may be a wide range of attitudes towards the use of PST.

An effective first step for consultants when working with new clients may be to assess the athletes’ current attitudes and behaviors related to PST since not all athletes may be willing to adopt PST practice. It has been advised by experienced consultants to only work with interested and willing participants (Ravizza, 2005). Heeding this advice may be problematic in two ways. First, even though athletes may be willing, they may not be equipped with the means to maintain new behaviors long-term. Second, according to the general rule of thumb previously stated (Ravizza, 2001), ignoring those athletes who are not interested or indifferent in sport psychology would likely be excluding approximately one to two thirds of an athletic/team population. Clearly, this may not be feasible or effective when working within a team atmosphere since only a fraction of the team would be “buying in” to what the consultant has to offer. Further, only working with athletes who are ready to begin a PST program would limit the scope of potential clientele for consultants attempting to build or grow their business.

One possible theoretical approach to working with individuals who are unsure of the need to change their behavior (in this case, adopt PST) or who are not regularly practicing mental skills to reap the benefits, would be to approach the adoption of PST as a behavior change. Consultants often suggest interventions to athletes that include regularly practicing new skills (e.g. daily imagery or relaxation training). To ask athletes for compliance to interventions is to ask them to perform a behavior change. Behavior change has been widely studied in addictive and healthy behaviors, and the application of many theoretical models in the intervention process have been supported in the literature (e.g. DiClemente, et al., 1991; DiClemente, 1993; Gorely & Gordon, 1995; Herrick, Stone & Mettler, 1997; Janis & Mann, 1968; Marcus, Banspach et al., 1992; Prochaska & DiClemente, 1983). Once such behavior change model is the transtheoretical model of behavior change (TTM, Prochaska & DiClemente, 1983). Prochaska and DiClemente formulated the TTM after studying smokers who were able to quit on their own. The authors postulated that at any given time, individuals could be categorized into one of five stages of change (SOC) relating to a particular behavior change process and change occurs as individuals progress through stages (Prochaska & DiClemente, 1983). The TTM has been applied to exercise behavior as an effective guide to tailor interventions to match a person’s stage of change at the onset of the intervention (Marcus, Banspach et al., 1992). Not only has the TTM been successfully applied to many health behavior changes (e.g., alcohol addiction, dietary behavior, exercise) in individuals (Prochaska et al., 1994), it has, on a limited basis, been applied to the adoption of PST (Grove et al., 1999; Leffingwell, Rider, & Williams, 2001; McKenna, 2001).

The most standard form of the TTM consists of the notion that readiness to change can be identified and categorized into one of five stages of change (Prochaska & DiClemente, 1983). These stages include: 1) precontemplation (not changing and not
considering changing the behavior), 2) contemplation (considering a change in the behavior within the next six months), 3) preparation (taking steps to start the behavior change or starting the change without regularity), 4) action (regularly engaging in the behavior change but for less than six months), and 5) maintenance (having changed the behavior for longer than six months). According to Prochaska and DiClemente, movement through the stages of change is typically fluid: relapses may occur, reverting the individual back to a previous stage, however, chances for relapse significantly decrease once the maintenance stage is reached. The categorization of individuals’ stages of change has been completed by use of questionnaires (e.g. Marcus, Selby, Niaura, & Rossi, 1992; Prochaska, Velicer, DiClemente, & Fava, 1988).

An assumption of the TTM is that the stage of an individual and processes used within each stage to change the behavior can be identified. Ten standard techniques individuals’ use to change behavior on their own have been identified, namely the processes of change (POC; Prochaska, Velicer, DiClemente, & Fava, 1988), and found useful across different behaviors ranging from smoking cessation to alcohol addiction (DiClemente, 1993). One example of a POC is reinforcement management, which occurs when an individual rewards himself/herself for making progress toward a goal (e.g. buying a new shirt after regularly exercising for one month); thus, supporting the new behavior. Change enhancing processes have been categorized into an experiential component (e.g., consciousness raising, emotional relief) and a behavioral component (e.g., stimulus control, reinforcement management). Some of these processes have been found to be used more effectively in certain stages (DiClemente et al., 1991; Prochaska & DiClemente, 1983), with more experiential or cognitive processes used effectively in early stages (i.e., precontemplation and contemplation) and more behavioral processes used effectively in latter stages (i.e., preparation, action and maintenance). Researchers have used the TTM to guide interventions by tailoring the intervention to the individual’s stage of change. In these tailored interventions, stage matched processes of change are used as intervention techniques and have been found to be more effective at promoting change than standard interventions (e.g. Marcus, Banspach et al., 1992; Peterson & Aldana, 1999; Prochaska, DiClemente, Velicer, & Rossi, 1993).

Since standard interventions tend to be geared toward people who are ready for action, these interventions would not seem useful for those who are still weighing the risks and benefits of change (Prochaska & Velicer, 1997). This is certainly true of PST where interventions are often structured towards teaching athletes how to implement mental skills into their training (Vealey, 1994). Although standard processes used in behavior change have been found in multiple behaviors, the need to confirm the same type of behavioral use in PST for sport is warranted (Leffingwell et al., 2001; McKenna, 2001). In other words, when athletes move from thinking PST is unnecessary in their training to incorporating regular practice of mental skills, it is unknown if athletes use the same cognitive and behavioral approaches to adopt a new behavior as they would for addictive and healthy behaviors. To date, only one known study has included an examination of the use of the processes of change in sport PST use (McKenna, 2001), indicating that a variety of processes were used across stages. Clearly, additional studies are needed to examine the application of the standard processes of change for PST use.
The TTM has been used to help describe and change behavior and has been related to other self-change concepts such as self-efficacy. Bandura’s (1977) theory of behavior, which is based on a person’s perceived self-efficacy towards successfully engaging in such behavior, has been found to positively relate to progression through stages of change (DiClemente et al., 1991). Self-efficacy has been found to be lower among those in precontemplation than those in action (DiClemente et al., 1991; DiClemente & Prochaska, 1985). More specifically, exercise self-efficacy scores were found to be greater with each stage from precontemplation to maintenance, with self-efficacy scores significantly differentiating each stage (except preparation and contemplation; Marcus, Selby, Niaura, & Rossi, 1992). When tailoring a consultation under the working framework of the transtheoretical model, a consultant may teach specific processes of change and focus on increasing self-efficacy for the change by allowing for short-term successful experiences.

Recently, the application of the TTM and self-efficacy has transcended addictive and healthy behaviors and has been applied to the adoption of psychological skills training for athletes (Grove et al., 1999; Leffingwell et al., 2001; McKenna, 2001; Zizzi & Perna, 2003). Leffingwell and colleagues adapted the original University of Rhode Island Change Assessment (URICA; McConnaughy, Prochaska, & Velicer, 1983) to measure behavior and attitudes related to mental skill use for performance enhancement, also known as readiness for change. Items were changed to reflect mental skill use and tested using two groups of intercollegiate athletes. The resulting scale, the Stage of Change – Psychological Skills Training (SOC-PST) reportedly measures readiness of change for PST in a complex manner similar to the URICA. The method of measurement reflects underlying assumptions that individuals have multiple attitudes and actions toward a behavior and may agree with attitudes or behaviors consistent with more than one stage of change (Rossi, Rossi, Velicer, & Prochaska, 1995). Thus, a respondent who completes the SOC-PST receives a score for each of four stages: precontemplation, contemplation, action and maintenance. Due to the complexities of the assumptions underlying the scale, the preparation stage was omitted by the researchers due to beliefs that this stage is merely a reflection of a combination of the contemplation and action stage. Leffingwell (2001) suggested that the SOC-PST can be used in three distinct ways including: 1) assigning a stage classification to an individual based on the highest subscale standardized score, 2) using the four subscale scores to understand a person’s motivational readiness profile or 3) by calculating a readiness index by subtracting precontemplation scores from the sum of the remaining subscales.

Along the same lines as previous applications of the TTM, Leffingwell and colleagues (2001) developed a self-efficacy scale for use of PST (SE-PST) and examined how self-efficacy and sport psychology consultant contacts were related to stages of change for PST. In a college athletic population, it was found that athletes in the action stage for use of PST reported higher self-efficacy to utilize PST than athletes classified in precontemplation, contemplation, or maintenance (Leffingwell et al., 2001). In the same study, subsequent contacts with a sport psychology consultant were more common for those classified in active stages at baseline, particularly those athletes in contemplation (49% sought consultations), action (64% sought consultations), and maintenance (36%...
sought consultations) compared to those in precontemplation (19%) over the course of a year. Thus, the application of the TTM could be a possible way of predicting client-initiated contacts, however, further research is needed in this area.

Although initial validation analyses for the SOC-PST had been completed by the authors in a research setting, it is unclear whether or not these scales are appropriate in an applied setting (Leffingwell, 2001). An earlier version of the SOC-PST was used to evaluate the impact of a brief sport psychology workshop (Zizzi & Perna, 2003). The authors of this study used the early version of the SOC-PST by assigning stage classification to college athletes in attendance. Not only was forward movement observed across athletes’ stages of change (e.g., from precontemplation to contemplation and contemplation to action), but negative movement was also observed (e.g., from action to contemplation and precontemplation) from before to after the workshop. However, no longitudinal data past one month was obtained, so long-term impact of the workshop was unclear.

A standard stages of change algorithm scale for PST was used in an applied setting to evaluate the effectiveness of a mandatory mental skills training program (Grove et al., 1999). It was found that the program implementation had a positive effect on changing the proportion of team members’ stages of change towards action and maintenance. So, the mere presence of a consultant and application of a standard intervention positively influenced movement across stages. However, the intervention in question was mandatory and provided to elite, male youth baseball players who were selected to an elite team and compared with those who did not make the team. In this instance the changes reflected could have been confounded by the differences in skill level or due to the involuntary nature of the mental skills training program. Thus, long-term, applied investigations including different demographics of participants need to be completed to test the effectiveness of application of stages of change to PST interventions.

Research on stages of change relative to sport psychology services is an emerging area of study and the use of stages of change measures for PST has been limited. Because many questions remain unanswered, more research assessing the stages of change for PST with different populations is needed. Consultations with teams tend to be fluid (dictated by needs of the team and individuals) and varied (team and individual work), thus, it would be helpful to study the application of the TTM to the more dynamic, applied setting when individual PST may not be mandatory. It is unclear what happens to athletes’ stage of change and self-efficacy for psychological skills training over time and whether measuring athletes’ stage of change are related to their chances of seeking out individual sport psychology consultation services. It could be that additional individual consultation sessions result in a sustained positive change in an athlete’s SOC due to individualized programs that may come from individual sessions. Thus, the central purpose of this investigation was to evaluate elite athletes’ stages of change and self-efficacy related to PST across four time periods when exposed to voluntary access to a sport psychology consultant. Further, a second purpose was to examine any differences in scores between those who initiated contact with the consultant and those who did not. In addition, an exploration of the processes of change used by athletes in the use of mental skills over the course of the investigation was conducted.
Based on previously discussed literature, it was hypothesized that there would be an interaction over time on the transtheoretical model related variables (Zizzi & Perna, 2003); more specifically, that there would first be an initial increase in contemplation, action, and maintenance scores (from time1 to time2). Scores would then be maintained over time by those who initiated contact, while scores would decrease for those who did not contact the consultant because contact would presumably keep people thinking about PST longer after the initial contact. The opposite was expected for precontemplation scores. No difference was proposed to be found in precontemplation scores between those who contacted and those who did not contact the consultant.

It was also hypothesized that self-efficacy scores would be positively correlated with contemplation, action and maintenance scores over time, with the strongest positive correlation being with action and a negative correlation with precontemplation (Leffingwell et al., 2001). Based on pilot research, those classified in the contemplation stage at time2 were hypothesized to show the highest subsequent contact rates compared to athletes in all other stages. Further, each process of change that had been previously identified (DiClemente & Prochaska, 1985) was hypothesized to have been used by at least one of the participants as indicated by a positive response on a checklist.

**METHOD**

**Participants**

Forty-five elite female rugby athletes originally started the study. The term “elite” refers to those athletes who were part of the pool of players that regularly attended National Team training camps and regularly competed in international matches. Respondents reported their age in ranges from less than 23 years, 23-28 years, 29-34 years, and greater than 34 years, with the majority (62.8%) of participants in the 23-28 year age range. Athletes represented seven different regions across the United States; 96% were Caucasian and 4% were African-American.

Participants attended a rugby skills testing and training camp in February (year withheld to protect anonymity). As members of the national squad, athletes trained or competed together four to five times per year for various lengths or time. After the February camp during this particular year, 33 athletes were selected to attend a smaller training camp in May, with 4 designated as alternates and 8 kept in the larger pool of elite players for possible future events.

**Assessments and Measures**

*Demographics and contact*

During the first data collection period, demographic information was collected to include participant age, number of years played, number of international matches competed in on a national level and previous exposure to sport psychology. Client-initiated contacts over the duration of the investigation were tracked.
Stages of Change. Leffingwell, Rider, and Williams (2001) constructed the Stages of Change for Psychological Skills Training Questionnaire (SOC-PST) to measure the readiness of athletes to adopt PST in sport. The SOC-PST is a 12-item questionnaire that measures 4 of the stages (3 items each for precontemplation, contemplation, action and maintenance sub-scales) identified in the TTM (Prochaska & DiClemente, 1983). Each statement is on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). “It might be worthwhile to work on my mental skills” is an example of an item on the contemplation scale and “I am actively working on my mental skills” is an item on the action scale. Items for each subscale (i.e., stage) were summed producing subscale raw scores. Raw scores were converted to subscale standardized scores. Thus, each individual who completed the questionnaire had scores calculated for each of the four stages of change being assessed. If a stage classification is desired, the highest standardized score across the four stages can be used to classify the individual as being in a single stage (Leffingwell et al.). It should be noted that the preparation stage is not assessed in the SOC-PST as the questionnaire’s authors felt that accurate assessment of a stage that may be very temporary and overlapping with other stages may not be plausible due to the likely cross loading.

The authors’ reported low to moderate internal consistency during original testing of the SOC-PST (see Leffingwell et al., 2001). Alpha coefficients in the present study were .69 for precontemplation, .70 for contemplation, .93 for action and .64 for maintenance. Divergent validity was demonstrated by the absence of significant correlations of subscales to the Marlow-Crowne Social Desirability Scale (Leffingwell et al.). Leffingwell et al. reported that construct validity was supported by the even distribution of individuals across stages once a stage of change was assigned, which is theoretically consistent with the TTM. Additional criterion validity of the SOC-PST was obtained by comparison of stage assignment with athletes’ previous and future involvement in sport psychology (Leffingwell et al.).

Self-efficacy
Self-efficacy was measured using the Self Efficacy for Psychological Skills Training scale (SE-PST, Leffingwell et al., 2001). The SE-PST is a 5-item scale that measures the perception that PST can be utilized or maintained regardless of potential barriers. Respondents are asked to rate sentences that start, “I am confident in my ability to work on my mental skills…” (Leffingwell et al., 2001, p.178) on a scale from 1 (not at all confident) to 5 (very confident). The items were adapted from Marcus, Selby, Niaura, and Rossi’s (1992) self-efficacy measure related to exercise. In the present study, a comparable alpha of .86 was found to that of the original data (see Leffingwell et al., 2001). Comparisons between SE-PST scores and stages of change revealed significant differences between those in action (highest) and those in the precontemplation, contemplation and maintenance stages. The authors suggested the need for further validation of this scale since the relationship of the SE-PST was not as expected with the maintenance stage of the SOC-PST, finding no significant differences between athletes in this stage compared to early stages.
Processes of change
The processes of change (POC) were assessed using a checklist and an open answer question sheet. Ten processes utilized in multiple behavior change studies have been identified (DiClemente & Prochaska, 1985). In this study, a checklist was constructed (see Appendix) by modifying the actual definitions of the processes previously identified in other behaviors (Marcus, Banspach, et al., 1992). The checklist is comprised of one definition for each of the ten processes. Two open-ended questions were added at the end of the checklist for additional thoughts or behaviors used in PST.

Procedure
Athletes were notified in writing before the onset of the study that the sport psychology consultant did not have a vote in the team selections process and because of anonymity, participation would neither help nor hinder their role on the team. Participants were given the SOC-PST and SE-PST four times over four months. Time one (T1) was before the onset of the first try-out camp in February with time two (T2) at the end of that camp. The first follow-up was one month later (T3) after selections for the next camp were announced and the final time (T4) was four months after the first administration in May of the same year. An informed consent letter and demographic information sheet were included at T1 and the processes of change checklist and additional behavioral questions were included in T4. The additional behavioral information gathered at T4 included questions regarding sport psychology involvement, barriers to seeking services and perceptions of the consultant’s approachability over the previous four months.

During the first camp, the sport psychology consultant held three, 1-hour team sessions and was available for individual consultations. The first session covered an introduction of the consultant’s role on the team, team cohesion, stages of team formation and an ice-breaker activity. A second scheduled session occurred on the morning of the third day and the topics of concentration, performance routines and self-talk were covered. An impromptu meeting was held to resolve a team conflict on the final morning prior to intra-squad scrimmages. The conflict was related to reactions to a newly implemented team ritual during training the previous day. A preliminary resolution was achieved and was again revisited during the May camp. The questionnaires were again given at the end of the camp (T2) as exposure to a consultant during camp may have affected stages of change (Zizzi & Perna, 2003).

Within two weeks of the camp’s end (T2), the sport psychology consultant sent an email to all players reminding them of the availability of PST services. Electronic and phone contact information for the consultant was included in all communication. Participants received three email reminders encouraging them to return T3 surveys over the course of three weeks.

Over the next three months, two email prompts reminding athletes of services offered and information available were distributed to the entire pool of players. Within this time, the second try-out camp for 33 of the participants was held and attended by the sport psychology consultant. Even though the complete original sample of 45 athletes was used
at each data collection period, these 33 athletes had additional in-person exposure to the consultant at this second camp. Three sport psychology related sessions were held at this camp: a problem solving activity and two workshop-like sessions on elements of successful teams.

**RESULTS**

**Contact Rates, Contact Themes and Previous PST Experience**

Forty-five participants were initially involved in the study, 31 of whom completed and returned all four questionnaires, representing a 31% attrition rate. Out of the original 45 participants, 10 individuals contacted the sport psychology consultant for one session, another 2 individuals for two sessions and 1 individual for three sessions for a total of 17 sessions. Eight of these athletes who had individual sessions completed the study. Ten consultations occurred during the first camp, two between T2 and T3, and five between T3 and T4 (four occurring at the second camp, two weeks prior to T4). The majority of contacts were in person with three occurring by email. Themes of individual sessions were coded separately by two knowledgeable professionals in the field and then compared for agreement. Considering some contacts had multiple themes, there were a total of 20 different issues brought to the consultant. Of those, 25% involved concentration, 15% the team, 10% confidence, 10% motivation, 10% decision making, 10% goal setting, 10% external stress, 5% anxiety and 5% personal issues.

Participants who completed the entire study were split into two groups, those who initiated contact and those who did not, to assess any differences between groups among variables measured. The participants attended the first 5-day camp with 23 of the 31 attending the second camp. Those who did not attend the second camp were either not invited or had injuries or scheduling conflicts. The contact group reported an average of 8.5 ($SD = 4.09$) years playing experience and had an average of 4.88 ($SD = 10.52$) rugby 15’s international matches played and .88 ($SD = 2.47$) rugby 7’s international matches played compared to 6.54 ($SD = 2.98$) years of experience, 2.48 ($SD = 4.75$) rugby 15’s international matches, and 1.17 ($SD = 2.74$) international 7’s matches for those who did not contact. Statistically significant differences were not found between the group ($n = 8$) who initiated contacted and the group who did not ($n = 23$) using t-test analyses for years experience $t(29) = -1.45, p = .158$, international 15’s match experience $t(29) = -.881, p = .385$, and international 7’s match experience $t(29) = .272, p = .788$.

Fifty percent of those who contacted the sport psychology consultant had previous experience with a consultant compared to 43.5% of those who did not contact. The most commonly listed previous contact with a sport psychologist practitioner by 22 respondents was with the team’s current consultant at previous team venues (81.8%). Others, as checked off a list or written in “other”, included coaches (13.6%) or with other teams or sports (22.7%). Previous experience with other types of mental skills training was reported by 37.5% of the contact group and 43.5% of the non-contact group. The most common other type of experience listed by 20 respondents was reading a book or
article (65%), followed by a sport science or psychology class (10%), relaxation tapes (5%), a nutritionist (5%), and a chiropractor (5%). The percentage of past experience with sport psychology appeared to be similar across contact groups, however, small cell sizes prevented the application of a chi-square analysis with this data.

**Stages of Change**

Four, 2-way repeated measures ANOVAs were utilized to test the difference in means across stages of change standardized scores between contactors and non-contactors. Homogeneity of variance using Levene’s test was found in all cases. The independent variables were group (contact vs. non contact) and time (pre-test, post-test, 1-month post-test, 4-month post-test), and the dependent variables were standardized scores for stages of change (precontemplation, contemplation, action, and maintenance). Significance levels were set at $p < .01$ to decrease the chance of Type I error that might have occurred with multiple analyses. Means, standard deviations, effect sizes, and power are shown in Table 1. A significant main effect for time was observed with precontemplation scores, $F(3, 87) = 6.60, p < .001$, $\eta^2 = .185$, observed power = .967, but not for other stages. A Least Significance Difference post hoc analysis was used to reveal that scores at T1 were higher than all other time scores. No significant differences between contact groups or interaction across time were found for any stages.

**Table 1. Means, Standard Deviations, Effect Sizes and Power for Stages of Change Standardized Scores Between Those Who Contacted and Those Who Did Not Contact the Sport Psychology Consultant**

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<thead>
<tr>
<th></th>
<th>Mean (Standard Deviation)</th>
<th>$\eta^2$</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 3</td>
</tr>
<tr>
<td>Precontemplation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contactors</td>
<td>49.22 (10.01)</td>
<td>41.90 (7.26)</td>
<td>44.34 (9.31)</td>
</tr>
<tr>
<td>Non-Contactors</td>
<td>47.36 (10.54)</td>
<td>44.82 (10.36)</td>
<td>44.18 (10.29)</td>
</tr>
<tr>
<td>Contemplation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contactors</td>
<td>57.24 (7.33)</td>
<td>57.24 (4.37)</td>
<td>53.55 (10.20)</td>
</tr>
<tr>
<td>Non-Contactors</td>
<td>54.40 (9.11)</td>
<td>53.55 (8.66)</td>
<td>54.62 (9.03)</td>
</tr>
<tr>
<td>Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contactors</td>
<td>48.05 (11.22)</td>
<td>53.03 (11.47)</td>
<td>51.28 (8.94)</td>
</tr>
<tr>
<td>Non-Contactors</td>
<td>46.43 (8.77)</td>
<td>50.87 (9.03)</td>
<td>49.65 (10.17)</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contactors</td>
<td>53.02 (12.31)</td>
<td>53.64 (13.81)</td>
<td>53.64 (8.25)</td>
</tr>
<tr>
<td>Non-Contactors</td>
<td>49.74 (9.17)</td>
<td>50.61 (8.82)</td>
<td>53.02 (8.16)</td>
</tr>
</tbody>
</table>

*a $n = 8$, *b $n = 23$.

*p < .01 for precontemplation main effects.

**Self-Efficacy**

Four Pearson Product moment correlations were used to explore the relationships of self-efficacy with stages of change scores at all four time periods. At all four times, self-
efficacy was positively correlated with action scores (T1 $r = .657$, T2 $r = .591$, T3 $r = .584$, T4 $r = .703$) and negatively correlated with precontemplation scores (T1 $r = -.525$, T2 $r = -.609$, T3 $r = -.637$, T4 $r = -.431$) at the $p < .001$ level. Correlations with contemplation (T1 $r = .255$, T2 $r = .298$, T3 $r = .124$, T4 $r = .062$) and maintenance were not statistically significant (T1 $r = .094$, T2 $r = .014$, T3 $r = -.043$, T4 $r = -.047$).

**Contact Initiation**

Stage classification as measured at T2 for those who contacted and did not contact the consultant during the course of this study are presented in Table 2. Small cell sizes prevented the application of a chi-square analysis on the data. However, of those who initiated contact, the majority (45.5%) were in the contemplation stage during T2. The remainder of those who contacted were categorized either in the action (27.3%) or maintenance stages (27.3%). No one from the precontemplation stage initiated contact with the consultant during the study.

**Table 2. Frequencies and Percentages of Stages of Change (at Time 2) for Those Who Initiated Contact and Those Who Did Not Initiate Contact over the Course of the Study**

<table>
<thead>
<tr>
<th></th>
<th>PR</th>
<th>CO</th>
<th>AX</th>
<th>MN</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>11</td>
<td>6</td>
<td>7</td>
<td>30(73.2%)</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>11(26.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>16</td>
<td>9</td>
<td>10</td>
<td>41*</td>
</tr>
</tbody>
</table>

Note. PR = precontemplation, CO = contemplation, AX = action, MN = maintenance; a positive contact was counted if at least one initiated contact with the consultant was made that led to an individual session in person or from a distance (e.g. telephone).

*Number reflects whole sample minus four missing values.

**Processes of Change**

Frequencies and qualitative analyses were used with the processes of change data. All ten processes of change included on the checklist were reported to have been used by almost half of the athletes in this study. The percentages of athletes who used certain processes were: consciousness raising (91.7%), environmental reevaluation (88.9%), social liberation (86.2%), stimulus control (80.6%), self-liberation (77.8%), counterconditioning (72.3%), helping relationships (72.2%), self-reevaluation (61.1%), dramatic belief (58.4%) and reinforcement management (44.4%). The 20 additional comments made by respondents to the open-ended questions were reviewed for themes by two researchers. Sixteen of these comments were determined to fit one of the 10 processes included in the checklist and previously identified by Prochaska and DiClemente (1983). The remaining four comments were classified as a description of the type of PST the participant used and not a method of change.
Additional Analyses

Participants were also asked to rate the approachability of the consultant during the last assessment period. On a scale from 1 (not at all approachable) to 7 (very approachable), the consultant’s approachability had an overall mean of 5.8 (SD = 1.22) for all 37 respondents, 5.77 (SD = 1.30) for those in the final non-contact group and 6.09 (SD = 1.04) for those in the contact group. An independent t-test was calculated and no significant difference between the two groups was found, t(35) = -7.23, p = .474. Of the 37 participants who indicated their reasons for not contacting the consultant, lack of time (27%) was cited most often, followed by not feeling as if they would benefit from services (13.5%), not being interested in the topic (5.4%), already performing at a high level (5.4%), and not being comfortable with the consultant (2.7%). Further, qualitative analysis of comments suggested that an additional 10.8% were uncomfortable asking, 8.1% lacked awareness or knowledge of the scope of consulting services, 5.4% stated they were currently doing PST on their own, and 2.7% stated they were lazy.

DISCUSSION

The transtheoretical model of behavior change has been applied to multiple addictive and healthy behavior changes and has only recently been applied to psychological skills training. The purpose of this investigation was to apply a stage of change and self-efficacy model to the use of psychological skills training in an elite population over time and to observe if differences occurred between those who did and did not initiate contact with a sport psychology consultant. Further, a preliminary look at the processes of change used by some elite athletes to incorporate mental skills into their overall training was explored.

Stages of Change over Time

It was hypothesized that the “active” stages of the TTM (contemplation, action, maintenance) would increase initially and then taper off for those who did not use the sport psychology consultant’s services. The opposite was expected for precontemplation scores. Overall, as seen in the results, the active stages of the model did not change significantly over time. One explanation for this is that the one-hour workshop specifically concentrating on PST skills (concentration, routines, self-talk) was not specifically tailored to influence stages of change, but rather to serve as a standard educational presentation, lends support for the need to tailor workshops to athletes of different stages. Those athletes who did seek individual consultations did not always want to discuss specific mental skills. This may explain why this group’s contemplation, action and maintenance scores did not change over time. On the other hand, precontemplation scores did decrease over the five days at the first camp. The try-out camp and the presentations by the consultant at this camp could have influenced this decrease in scores. This camp marked the start of the season for many of these athletes...
and the sport psychology and team building presentations may have served as a reminder of the importance of PST use in sport.

**Stages of Change between Contact Groups**

Differences were not found over the course of the study in stage of change scores between those who initiated contact and those who did not, nor did they differ over time. This may have been due to the small sample size which limited the power and made it more difficult to find significant differences. It could also be that some athletes in the non-contact group were already practicing and comfortable with their PST program and continued to do so without utilizing the sport psychology services. Perhaps given that all athletes were present for the team session workshops, these initial team sessions may have influenced attitudes towards and practice of PST. This is indicated by the second most selected reason for why athletes did not seek consultation services, which was that they did not think they could benefit from services. It may also be true that since the majority of the contact group only had one session with the consultant, this proved to be too little of an intervention to affect scores. Furthermore, the types of issues brought to consultations were often for specific on-field concerns that resulted in one or two suggestions for changes. Perhaps these small adjustments were not significant enough to be reflected in stage of change scores for PST use.

**Self-Efficacy**

Self-efficacy was proposed to be positively related to contemplation, action and maintenance scores and negatively related to precontemplation scores at all time periods. Self-efficacy in this study was negatively related to the precontemplation and positively related to action scores at all time periods, partially supporting the hypothesis. Perhaps increasing athletes’ self-efficacy in being able to incorporate a PST program into their training could decrease their precontemplation scores and move them into action. Since the present study was correlational in nature, cause and effect cannot be concluded; thus, it could be that self-efficacy scores increased as a result of PST training. Perhaps requiring a mandatory PST program would increase self-efficacy. Grove et al. (1999) found that a mandatory PST program influenced positive changes in soccer players’ stage of change scores. The present results support cause for further research to examine the effectiveness of focusing on improving self-efficacy in adherence to PST programs. It should be noted that the absence of almost any relationship between self-efficacy and maintenance scores is concerning. This is similar to results from Leffingwell et al. (2001) where self-efficacy scores for those classified in maintenance were not different than those in precontemplation or contemplation. One possible explanation for this was the face validity of the maintenance items. Upon closer examination of the maintenance items, it seems that these items might actually measure relapse rather than maintenance (e.g., “I have been successful working on my mental skills, but I’m not sure I can keep up the effort on my own”, “After all I’ve done to try to change my mental skills, every now
and again I slip back into old habits”). Closer scrutiny of maintenance items before further use of the SOC-PST questionnaire (Leffingwell et al.) or use of the less complex stage of change ladder alternative (Grove et al.) is recommended.

**Sport Psychology Contacts**

It was also hypothesized that those who initiated contact with the consultant would be more likely to be classified in contemplation. The contacting group was more likely to have been in the contemplation stage which supported the results from the pilot study, but differed from Leffingwell et al. (2001) where contactors were more likely to have been in action. It is unclear if this difference was due to the level of athlete (elite vs. collegiate), conceptual definitions or due to differences in how services were marketed to the athletes between the two investigations. Another explanation is that the home bases of the athletes’ who participated in this study were spread out across the country and the majority of participants may not have had close access to a sport psychology consultant as was the case in Leffingwell and colleagues’ study. Therefore, the move from contemplation to action by the current sample could not happen until the athletes had exposure and access to a sport psychology consultant. In this case, this occurred at the first camp for some athletes. Regardless, the findings in the present study support that an initial assessment of individual athletes’ stages of change might be helpful in identifying how many potential clients will seek services.

**Processes of Change**

In terms of those processes reportedly used by athletes regarding PST, as expected all processes previously identified (Prochaska & DiClemente, 1985) were reported to have been used by this sample of athletes. Further, the majority of processes of change had been used by at least 50% of the participants in this study. The most frequently reported process of change utilized was consciousness raising. Nearly all of the participants had used consciousness raising by gathering information about the use or effect of mental skills on sport performance (e.g., read a book). The encouragement of bibliotherapy or recommendations of informative websites for PST programs might prove beneficial when working with new athletes, especially those who are at a distance. Further, development of a processes of change for psychological skills training scale is necessary and may eventually help to tailor interventions according to stage of change.

**Stages of Change Measurement**

Upon closer inspection of scores and the scoring practice of the SOC-PST, the authors note validity concerns with this assessment tool. There are multiple recommended methods of use and scoring for the SOC-PST (Leffingwell, 2001). The present study used two of these scoring methods for different analyses. Individuals’ standardized scores
were used for some of the previous analyses, and stage assignment was used in another. To assign a stage, the highest standardized score is chosen from all four stage scores per individual. In some cases, differences between stages were determined by $1/10^\text{th}$ of a point. Sometimes this small disparity was the difference between assigning someone to the precontemplation rather than the action stage. It seems that a stage of change ladder may be more accurate in categorizing an individual’s stage since the definitions of each stage are clear (Grove et al., 1999).

Another possible shortcoming of the SOC-PST that became evident post analysis was the absence of the preparation stage, which might prove to be detrimental in the study of psychological skills training in sport. Personal experience lends one to believe that practice of PST may be irregular, coinciding with seasonal play or game importance (e.g., working more on positive self-talk during pre-season compared to off-season); this irregular practice is not discernable from regular weekly practice of PST on this scale. Although from the current study it appears that the transtheoretical model is a model that has some application use for PST and athletes, the SOC-PST scale should be used with caution. Further validation between the SOC-PST and perhaps a stage of change ladder suggested by Grove et al. (1999) is warranted before integrating this assessment into an intervention package.

**Limitations**

The use of the national pool sample limited the generalizability of the results as the athletes were only women, represented one sport and possessed a high skill level. The field study research design utilizing an intact group limits the inferences that can be drawn as there was no control group and various external components could have influenced the results. Another limitation of these procedures was that the first author served as the consultant for the team. This dual role could have inherently caused potential experimenter bias, as the participants may have perceived inadvertent subtle behaviors or cues from the researcher to increase contacts or reinforce positive attitudes towards mental skills training. Another possible limitation affecting the number and type of contacts was the need for athletes to initiate long distance contact. Zizzi and Perna (2002) found that younger athletes preferred electronic methods for contacting a consultant compared to traditional methods such as using the telephone or in person, but this may not have been consistent for these older athletes.

**SUMMARY**

Overall, the findings from this study provided some preliminary evidence that the TTM can be successfully applied to PST program development and evaluation of interventions. Further examination of stage of change assessment tools is needed in future research; however, the present findings could potentially offer consultants with valuable information regarding self-efficacy of PST use, profiles of consultation seekers, and processes of change used in self-development of PST programs. The reason most often
reported for not contacting the consultant was lack of time, which is similar to past research findings (Zizzi & Perna, 2003). Therefore, addressing how one can fit consultations and mental skills practice into their daily training in one of the initial consultations could be beneficial to athletes and increase their self-efficacy. Perhaps asking athletes in maintenance to share with their teammates the ways that they practice their mental skills could increase self-efficacy and move them along the stages. The findings were promising concerning the processes of change, having supported the same processes used for PST as in other behaviors. This was an initial theoretical concern as it was not clear whether or not these processes of change, which are essentially mental skills in themselves, are used to change the use of mental skills for performance enhancement. The development of a more detailed scale to assess and monitor the processes of change would seem useful to help tailor interventions to individual stages. Tailoring interventions using the transtheoretical model and processes of change framework may be one method to approach the recommendation to individualize consultations to athletes (Gould et al., 1989).

Future research does need to critically assess the validity of the types of scales used in this area to determine the best method of measurement. A stage of change ladder may be more reliable and convenient in multiple assessments as it is only one item per stage and includes a preparation stage. However, in order to do this successfully there needs to be a standard definition of the regular use of mental skills in a PST program.

APPENDIX

Directions: The following are a list of thoughts or behaviors that can be experienced or utilized during behavior change. Please indicate if you have had similar thoughts or have done similar behaviors in relation to mental skills use in sport EVER and/or in the LAST 4 MONTHS.

<table>
<thead>
<tr>
<th>EVER</th>
<th>LAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MONTHS</td>
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</tr>
<tr>
<td>☐ Yes</td>
<td>☐ Yes</td>
</tr>
<tr>
<td>☐ Yes</td>
<td>☐ Yes</td>
</tr>
<tr>
<td>☐ Yes</td>
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</tr>
<tr>
<td>☐ Yes</td>
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</tr>
<tr>
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<tr>
<td>☐ Yes</td>
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</tr>
<tr>
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<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Please list other common thoughts you have about mental skills training:

Please list other common practices (behaviors) you do regarding mental skills training:

**REFERENCES**


Ravizza, K. (2005, October). *Think about how good it’s gonna feel: Lessons learned on a journey of performance excellence.* Keynote address presented at the annual meeting


TRANSITIONING OUT OF SPORT: THE PSYCHOSOCIAL EFFECTS OF COLLEGIATE ATHLETES’ CAREER-ENDING INJURIES

Amber L. Stoltenburg, Cindra S. Kamphoff*, and Karin Lindstrom Bremer
Minnesota State University, Mankato, MN, USA

ABSTRACT

Career-ending injuries constitute a unique type of transition that any athlete may face (Wylleman, Alfermann, & Lavallee, 2004). Therefore, the intent of this qualitative study was to examine the psychosocial effects that accompany an athlete’s transition out of sport due to a career-ending injury. Semi-structured interviews were conducted with seven Division I and II athletes who experienced a career-ending injury in the last five years. After a comprehensive and extensive analysis of the interview transcripts, five themes emerged: 1) Consequences of the injury, 2) Social support, 3) Athletic identity, 4) Nature of the injury, and 5) Pre-retirement planning. In general, findings indicated that athletes experienced a wide array of both positive and negative emotions triggered by the realization that their sport career had come to an end. Findings support the Conceptual Model of Adaptation to Career Transition (Taylor & Ogilvie, 1994).

TRANSITIONING OUT OF SPORT: THE PSYCHOSOCIAL EFFECTS OF CAREER-ENDING INJURIES OF COLLEGIATE ATHLETES

The termination of a career in sports is a significant time in an athlete’s life (Alfermann, 2001) that is accompanied by a process of transition and change (Taylor et al., 2006). The adjustment includes a change in self-perception, the social environment, and emotions and relationships (International Olympic Committee, n.d.). Given the significance of athletic retirement, researchers have begun to examine athletic retirement as more of a life event rather than a single event (Blinde & Greendorfer, 1985; Wylleman, Alfermann, & Lavallee, 2004). Similarly, Taylor and Ogilvie (2001) argued that in order to understand athletic retirement in its entirety, the experience must be viewed as a transition; a process streaming from the beginning of athletic involvement through post-athletic participation.

Researchers have identified many different reasons why athletes leave their sport career; these reasons can generally be categorized into two clusters: normative and non-
normative transitions (Schlossberg, 1984). Normative transitions occur when an athlete’s decision to leave sport is anticipated in nature, such as when an athlete graduates. Non-normative transitions, on the other hand, occur unexpectedly such as when an athlete suffers a career-ending injury (Blinde & Greendorfer, 1985). Furthermore, age, de-selection, injury, and free choice were suggested by Taylor et al. to be the four most common reasons as to why athletes leave their sport. Taylor et al. incorporated these four reasons into their Conceptual Model of Adaptation to Career Transition.

**CONCEPTUAL FRAMEWORK**

Taylor and Ogilvie’s (1994) Conceptual Model of Adaptation to Career Transition, hereafter referred to as the Conceptual Model, provides a thorough framework for examining the transition process. Taylor and Ogilvie’s model includes the following components: the cause for career termination, factors related to the quality of transition, available resources for the athlete experiencing the transition, and interventions that can be used to assist an athlete in their transition. The Conceptual Model is comprised of five different stages; within each stage are factors that influence the successfulness of an athlete’s transition (see Taylor et al., 2006 for a complete description). Stage 1, which covers the reasons of career termination mentioned above, includes age, de-selection, the consequences of an injury, and free choice. Stage 2 centers around factors related to the adaptation to career transition. Developmental contributors, self-identity, perceptions of control, and personal, social, and environmental variables are included as factors in Stage 2. Stage 3 lists available resources for athletes who are adapting to a career transition. Coping strategies, social support, and pre-retirement planning are all noted as adequate resources. Stage 4 addresses the quality of the career transition, resulting in either a healthy or distressful response to retirement. By this stage the athlete’s reaction to the transition will be evident and the quality of the individual’s transition is dependent upon the previous steps of the retirement process. Stage 5 includes intervention strategies that can be implemented by professionals working with athletes to assist the athlete in their transition.

Although several researchers have investigated components of Taylor and Ogilvie’s (1994) model (c.f., Alfermann, Stambulova, & Zemaityte, 2004; Coakley, 2006; Grove, Lavallee, & Gordon, 1997; Koukouris, 1991; Stephan, Bilard, Ninot, & Delignieres, 2003), Coakley (2006) is the only researcher to investigate the entire Conceptual Model. Coakley, however, did not specifically investigate career-ending injuries. In her dissertation, Coakley examined the sport-career transition experiences of seven recently retired National Football League (NFL) athletes. She found that most athletes described that their preparations for retirement were inadequate, resulting in negative feelings of subjective well-being. In support of the Conceptual Model, Coakley concluded that “the sport-career transition is a complex, multidimensional process and the outcome is contingent upon the individuals’ cognitive, social, behavioral and emotional resources and level of preparation for the sport-career transition” (p. 2). Since Coakley’s dissertation is the only research study found to date investigating the entire Conceptual
Model, we conclude that no study has used the entire model to explain athletes’ experiences with career-ending injuries.

CAREER-ENDING INJURIES

As Wylleman et al. (2004) argued, perhaps the most unfavorable transition in sport that can cause early retirement is when an athlete experiences a career-ending injury. One of an athlete’s worst fears is being hurt, due to the possibility that the injury will be severe enough to cause early retirement (Baillie, 1993). Researchers acknowledge that an athlete’s reaction to a career-ending injury can include a range of emotions, including grief, identity loss, loneliness, anxiety and fear, loss of confidence, depression, alcohol abuse, and even suicide (Alfermann et al., 2004; Lally, 2007; Pearson & Petitpas, 1990).

A case study detailing an athlete’s experience transitioning out of sport due to a career-ending injury was conducted by Lotysz and Short (2004). Lotysz, a former NFL player, recalled personal details from his experience with a career-ending injury. The findings from this study illustrate how an athlete who was forced to retire due to an injury can encounter serious difficulties adapting to life as a non-athlete. The severity of Lotysz’s injury resulted in long-term physical impairments; social, financial, and employment difficulties were also noted. Lotysz recollected emotional difficulties as well. In general, the non-normative transition and the suddenness of the injury caused a long-term, negative impact on Lotysz’s life.

In another study on career-ending injuries, the authors focused on the general well-being of collegiate athletes (Kleiber & Brock, 1992). More specifically, current life satisfaction and self-esteem were evaluated. It was found that participants who sustained career-ending injuries during college reported lower life satisfaction five to ten years following retirement compared to participants who were not injured. In addition, participants who had a high professional sport orientation while in college (i.e., they believed they would enter a career in professional sport) had lower life satisfaction and self-esteem after college compared to the low professional sport orientation group. When evaluating their experience after college, the high professional sport orientation group showed lower self-perceived success in school, less participation in the selection of their courses, a lower grade point average, and less perceived value of education because they had a greater psychological investment in professional sports (Kleiber & Brock).

Career-ending injuries constitute a unique type of non-normative transition that any athlete has the potential to face (Wylleman et al., 2004). To date, much of the research on sport-career transition has been focused on normative events, whereas research on non-normative events has been neglected (Wylleman et al.). In addition, since a career-ending injury is the least foreseeable cause of athletic retirement (Baillie, 1993), it is imperative to take a more in-depth exploration into the psychosocial effects of an athlete’s transition due to career-ending injury. The purpose of this study was to examine the psychosocial effects that accompany an athlete’s transition out of sport due to a career-ending injury using the entire Conceptual Model of Adaptation to Career Transition (Taylor & Ogilvie, 1994; Taylor et al., 2006).
METHODS

Participants

Seven former Division I and II collegiate athletes (5 males, 2 females) were interviewed to gain an in-depth understanding of their transition following a career-ending injury. All interview participants met the following criteria: 1) had been a former collegiate athlete, 2) had experienced a career-ending injury as a collegiate athlete, and 3) transitioned out of collegiate athletics within the last five years. See Table 1 for demographic information.

Table 1. Participant Demographic Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Gender</th>
<th>Race</th>
<th>Sport</th>
<th>Position</th>
<th>Youth-H.S. Years</th>
<th>College Years</th>
<th>Last season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean</td>
<td>22</td>
<td>Male</td>
<td>Caucasian</td>
<td>Football</td>
<td>Middle LB</td>
<td>8</td>
<td>2</td>
<td>Aug-05</td>
</tr>
<tr>
<td>Nicholle</td>
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<td>Caucasian</td>
<td>Hockey</td>
<td>Fwd</td>
<td>12</td>
<td>3</td>
<td>Mar-07</td>
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<tr>
<td>Lisa</td>
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<td>Center MidField</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Anthony</td>
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<td>African American</td>
<td>Basketball</td>
<td>Small Fwd</td>
<td>11</td>
<td>4</td>
<td>Jul-08</td>
</tr>
</tbody>
</table>

Notes: Age (M=22.86, SD=1.35); Youth-H.S. Years (M=12.29, SD=2.43); College Years (M=3.36, SD=.75)

Procedures

Upon obtaining IRB approval for the study, a pilot interview was performed with a former collegiate athlete who had suffered a career-ending injury. Following the pilot interview, the participant provided feedback regarding the clarity and applicability of the questions. Through the feedback, the researchers made slight changes to the wording of the interview guide.

Purposive criterion sampling was used to select the main participants of this study (Daly, 2007). Head coaches and university athletic training program coordinators were contacted to acquire the names and contact information of former athletes who had experienced a career-ending injury. The head coaches and athletic training program coordinators were asked to receive permission from the athlete prior to forwarding their contact information to the first author. The first author then contacted each prospective participant via email or phone to explain the purpose of the study and to arrange an interview time. All but one of the individuals contacted agreed to be interviewed.

Semi-structured interviews were conducted either face-to-face (n=4) or via telephone (n=3). Each interview ranged from 35-60 minutes. At the start of the interview, each participant completed a demographic questionnaire (including items such as age, race/ethnicity, sport, education, length of athletic participation, and length of time since their forced retirement from sport) and signed the consent form. If the interview was
conducted via telephone, documents were either emailed or sent through the mail and returned to the first author. Each interview was audiotaped and transcribed, and field notes were recorded by the first author.

The interview guide consisted of a set of predetermined questions intended to address the athletes’ experiences with career-ending injuries and their sport-career transition. The interview guide was developed by utilizing The Conceptual Model (Taylor & Ogilvie, 1994; Taylor et al., 2006) as a guide and by reviewing interview content from a similar study (Coakley, 2006). See Table 2 for example questions.

Table 2. Sample Interview Questions

<table>
<thead>
<tr>
<th>Circumstances Surrounding the Sport-Career Transition</th>
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<tbody>
<tr>
<td>1. What were the circumstances surrounding your decision to withdrawal from collegiate athletics?</td>
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<tr>
<td>2. What were your immediate reactions/thoughts when you first became injured?</td>
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<thead>
<tr>
<th>Psychosocial Factors Related to the Sport-Career Transition</th>
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<tbody>
<tr>
<td>1. What type of activities (besides sports) were you involved in during your sport-career?</td>
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<tr>
<td>2. While still competing at the collegiate level, how much thought did you give to the potential of having to unexpectedly end your participation in sports?</td>
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<tr>
<td>3. From your experience, what were the most difficult aspects of your unexpected retirement from sports?</td>
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<tr>
<th>Perceptions of Control</th>
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<tr>
<td>1. How unexpected was your injury and decision to retire?</td>
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<tr>
<td>2. How do you think the unexpected nature of your injury/transition affected you?</td>
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<tr>
<th>Athletic Identity</th>
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<tbody>
<tr>
<td>1. On a scale of 1-5 (1 representing a weak identification, 5 representing a strong identification), how connected were you with your identification as an athlete?</td>
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<tr>
<td>2. How did you identify with yourself after the transition had begun, up until now? Do you still identify with your role as a former athlete?</td>
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<tr>
<th>Social Identity</th>
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<tr>
<td>1. What group(s) of people did you spend most of your time with during your collegiate years/competition?</td>
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<tr>
<td>2. How did you think your social network changed after you were no longer participating in college sports?</td>
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<tr>
<td>3. What were the most significant social changes (thoughts/feelings) that you experienced after withdrawing from your sport-career?</td>
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<th>Developmental Experiences</th>
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<tr>
<td>1. When do you think a college athlete should start preparing for the “real world”?</td>
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<tr>
<td>2. What do you feel could be done to help prepare athletes who may have a similar experience to yours?</td>
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<tr>
<th>Available Resources for Adaptation to Career Transition</th>
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<tbody>
<tr>
<td>1. Explain how you chose to “deal” with your career transition. What type of coping mechanisms did you utilize?</td>
</tr>
<tr>
<td>2. Did you partake in any type of pre-retirement planning prior to being injured?</td>
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<tr>
<td>3. Looking back, what would have been most beneficial to help with your transition?</td>
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<tr>
<th>Quality of Career Transition</th>
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<tr>
<td>1. As best as you can, please describe the quality (negative/positive) of your adaptation and transition.</td>
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<tr>
<td>2. What positive things did you experience during your transition?</td>
</tr>
<tr>
<td>3. What negative things did you experience during your transition?</td>
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<tr>
<td>4. Looking back, is there anything you would have done different to help adapt to the transition?</td>
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</table>
Data Analysis

The qualitative analysis approach described by Creswell (1998) was utilized to analyze and interpret the interview data. Creswell described the analytic process through a series of stages by: 1) analyzing the specific interview content, 2) developing themes from that content, and 3) making a thorough conclusion to identify each and every possible meaning of the participants. This process first began as the researchers read the transcripts thoroughly. Key phrases that were significant to the purpose of the study were highlighted; corresponding conceptual labels were then written in the margins of the transcripts. For example, the comment, “The best feeling in the world was coming out of the surgery, opening my eyes, and seeing my whole family there…” was labeled as “positive social support.” Significant content from each interview was labeled in this way. The conceptual labels were then placed into a theme along with similar statements, and the theme was named (for example, all comments related to social support were gathered and the theme was named “Social Support”). The three researchers met to discuss and finalize the themes. Statements of the participants were then identified to exemplify each theme. Pseudonyms were used to protect the participants’ identities.

Trustworthiness

Scholars of qualitative methods are in agreement that the establishment of trustworthiness is essential to determine if the findings are accurate from the standpoint of the researcher(s), participants, and readers (see Creswell, 1998 for a discussion). Specifically, Creswell suggested multiple procedures of establishing trustworthiness should be used. Additionally, Sparkes and Smith (2009) argued that a list of criteria or procedures to establish trustworthiness should “act as a starting point” for judging the research, and this list should not be blindly applied to all situations. Instead, they argued that researcher(s) should explain the trustworthiness techniques used, provide a rationale for why these techniques were relevant to the situation, and offer a description of how these techniques were carried out with care and attention.

In light of these suggestions, the following three procedures were used to verify the data: 1) member checking, 2) prolonged engagement, and 3) triangulation. First, to ensure accuracy of the interview content, each individual was provided a copy of their transcribed interview. Member checking was used in this study to ensure a truthful and accurate depiction of each participant’s experience before the researchers began the data analysis. Each interview was transcribed carefully and then sent to the participant via e-mail to confirm their experience. Second, to ensure the researchers became familiar enough with the interview data to conduct a thorough and accurate data analysis, and to become as familiar as possible with each participant’s experience, the researchers took part in prolonged engagement. To address prolonged engagement, the first author carefully transcribed the interviews and then listened to each interview while simultaneously reviewing the transcript. In addition, each transcript was read multiple times by all three researchers. Third, to ensure the first author interpreted the interviews...
correctly, the other two researchers, with doctoral degrees and extensive knowledge in qualitative methodology, were used to confirm the identified themes through a process called investigator triangulation (Creswell; Miles & Huberman, 1994). Investigator triangulation was essential to this study to ensure the first author’s biases were minimized as much as possible. Each researcher went through a detailed process of coding the transcripts, which is outlined in the Data Analysis section above.

RESULTS

After a comprehensive analysis of the interview transcripts, five distinct themes emerged: 1) Consequences of the injury, 2) Social support, 3) Athletic identity, 4) Nature of the injury, and 5) Pre-retirement planning.

Consequences of the Injury

It was evident that each participant experienced both negative and positive consequences resulting from the termination of their sport career. The following four consequences greatly impacted their transition: 1) Psychosocial adjustment, 2) Role of education, 3) Role on the team, and 4) Involvement in other activities.

Psychosocial adjustment

Generally, the participants in this study noted the adjustment process to their career-ending injury lasted between six months and one year. Additionally, the majority of participants (6 of 7) said that the unexpected end to their sport career was very difficult to initially accept. A common feeling was that “it wasn’t real at first” and feelings of “disappointment,” “devastation,” “bitterness,” and “depression” were common reactions. Nicholle, a 21 year old hockey player, said that she was “absolutely devastated” when she realized she could no longer play. Nicholle discussed how she reacted when forced to leave sport:

I had worked so hard. I had left home when I was eleven for this sport. It’s something that I love to do… I love it. I would think about not being able to play and break down completely; I would just be sobbing. I couldn’t help myself, and I am not a crier … I took it really, really hard.

While six of the seven participants initially experienced negative emotions after their injury, they agreed that as time passed the transition became more positive and they “accepted it and moved on.” Tyler, a 23 year old hockey player, was the only participant whose injury was life-threatening and he approached the situation more positively. Tyler was just thankful to be alive; he said, “There’s more to life than athletics and they were always going to end someday. You appreciate the little things in life a lot more.”
Role of education
The majority of participants admitted to having a lack of dedication toward their education while pursuing a career in sports. However, their career-ending injury forced them to focus on their future. Chase, a 25 year old hockey player, said that he was able to increase his “concentration on school” when his sport career was over. Lance, a 24 year old football player, described an increased interest in education as a positive consequence of the transition. Lance stated: “I was able to focus more on my career goals—on what I wanted to do post-athletics.”

Prior to their career-ending injury, few participants had started planning for a career outside of sports. These participants recalled being encouraged by parents to realize that their sport career would eventually end. The participants that received parental advice took a more realistic approach to sports. More specifically, these participants were advised by their parents to “have something to fall back on.” For example, Tyler talked about how his mother encouraged a balance between sport and education from a young age:

Hockey and sports are terminal; I have been told this from my mother ever since I was a little kid. School, education, and the work you do as a human being last forever…sports will end.

Role on the team
An inevitable consequence of the injury was that each participant had to choose whether or not to stay involved with their team; four of the seven participants chose to stay connected in some way. Two of the interview participants (Lance and Anthony) continued to help out as much as they could. They viewed staying involved with the team as generally positive, and their continued involvement allowed them to experience different roles on the team. As Anthony, a 23 year old basketball player mentioned, it allowed him to become a “motivator and leader” on the bench rather than on the court. Continuing to help out with the team was also a way Lance transitioned away from sport. He stated:

I think that [staying involved with the team] helped me to move on. I think it was a positive thing in the fact that I was not completely um… away from it. I was able to kind of slowly adjust to saying ‘yes, this is the end of it and I need to move on.’

However, not all of the participants who stayed involved with their team thought it helped their transition. Dean, a 22 year old football player, said that he was “stuck doing odd jobs” and it made him feel like “the bitch of the team.” Similarly, Lisa, a 22 year old soccer player who chose to volunteer as coach with her team, thought that being on the coaching side of things “was incredibly difficult.”

Involvement in other activities
All participants agreed that because a collegiate sport career takes up so much time, there is rarely extra time for other activities. Experiencing the end of their sport career made the participants realize the value of getting involved in other activities. After their
injuries, the participants had more time to spend on other personal interests, allowing them to have a more balanced life. For example, Dean talked about how nice it was to decide what he wanted to do with his free time as opposed to “being forced to do workouts and stuff.”

For two participants, a career in coaching became their new focus. For Chase and Nicholle, coaching was a way for them to transition out of sport, yet stay involved in the sport they loved. Chase reported that coaching immediately after his injury “somewhat filled the void of playing.” Whereas Nicholle stated,

I would have to say that coaching has been one of the best things that has ever happened to me. So, if stuff happens for a reason, then this definitely has to be the reason that this [injury] happened to me. To be able to have such a positive influence on these kids … I feel like that’s much more important than me playing my senior year.

In sum, the majority of participants reported difficulty accepting the unexpected end to their sport career, but all agreed that as time passed the transition became more positive. In addition, the career-ending injury allowed the athletes to focus more on their education and future. Around half of the participants remained involved with their team and while staying involved made the transition easier for some, it caused more difficulty for others.

Social Support

One of the most prominent themes that emerged during the analysis of the interview content was social support. Under social support, two subthemes emerged: 1) Positive social support, and 2) A lack of social support. There was a clear difference in the participants’ adjustment who received positive social support compared to those who lacked social support.

Positive social support

The majority of the athletes interviewed (5 of 7) had a very strong and stable support system that helped them adjust during the transition. These participants concluded that having a strong support system during this time had a significant impact on the adjustment process; they all concurred that the transition would not have “gone as smoothly” without adequate support. Three participants specifically mentioned the impact of family support and how their families “did everything they could to make [the transition] easier.” Tyler, for example, reflected on the major role his family played in his transition:

My family support has been phenomenal. My brothers live in the [state] and they drove all the way down to the [hospital] that night. My other brother plays [professional sports]: he got a leave of absence from his team and took the first flight he could down. My whole family was there supporting me. They have been great.
Two other participants, Lance and Anthony, recalled the positive relationships and social support they had with their teammates after their final injury. Lance described his situation further:

I talked to [my teammates] a lot and they were very supportive of my decision. They understood what was happening and they understood that it was probably for the better that I made this decision [to stop playing]. They were very supportive.

**Lack of social support**

Two participants did not have as much social support as they wanted or needed. Chase described his social support as deficient, stating that “There wasn’t a lot of support to be honest. It was a pretty crappy time for a couple years there.” With parents living 37 hours away and teammates who “just don’t get why [I wasn’t playing],” Chase found it difficult to find the social support he needed. Lisa did not tell her family about her injury, and did not seek out support from coaches, teammates and friends, even though she knew they “would have been there.” Instead, Lisa tried to go through the transition on her own. Lisa expressed the impact that not seeking social support had on her during this time:

So, I felt very alienated and alone, and that probably was why it felt so negative. When it’s just you and your thoughts it’s like… ugh. There was no one… there was no one there to get [anything] for you. It was horrible.

In sum, all of the participants discussed the importance of social support throughout their transition. Participants reported considerably easier transitions when they received positive social support from teammates and parents. Those who lacked social support, however, recognized the negative impact this had on their transition after the career-ending injury occurred.

**Athletic Identity**

All of the participants were asked to rate their level of athletic identity on a scale of 1 (very weak) to 5 (very strong). Each athlete discussed the impact their athletic and social identities had on adjusting to the end of their sport career.

**Impact of an athletic identity**

Five of the seven participants rated themselves as a 5 and stated they had a very strong athletic identity during their sport career. Each of these athletes agreed that having such a strong athletic identity “made the transition a lot harder” because their sport “was very important” to them. Lisa, for example, discussed how her strong athletic identity impacted her transition stating, “I didn’t know what else to do with myself. I really didn’t know what else I was besides an athlete.” Tyler was the only athlete with a relatively weak athletic identity (rating himself a 2). He stated that he wanted to be known as more than “just a hockey player” and attributed his successful transition to his weak athletic identity:
I think it helped me because my whole identity wasn’t just as a hockey player. When you consider yourself, and measure yourself as a person just based on how good of a hockey player you are, then what’s really there? So, [not having a strong athletic identity has] helped me out big time during this transition.

**Importance of a social identity**

Five of the seven participants interviewed described their social network as being very limited in regards to the diversity of people they spent time with during their sport career. All of the participants with a very strong athletic identity were “surrounded by athletes” and many of these participants admitted that they did not spend time with friends outside of sport. Therefore, when they had to transition away from sport they had to create and adjust to a new social network.

Instead of spending large amounts of time with athletes and teammates, two participants (Tyler and Lance) chose to have a social identity outside of athletics during their sport career. For Tyler and Lance, expanding their social network contributed to a positive adjustment because they did not have to create a new group of friends once their sport career was over. Lance expressed his feelings about having a social identity beyond the athletic realm. He stated:

I think it actually helped quite a bit. I had always hung out with people who weren’t athletes so I had a life away from the people who experience nothing but athletics…It made it very different and helped a lot.

In sum, the majority of the participants rated their athletic identity as very strong. Consequently, this made the transition out of sport difficult because their social network only included former teammates. The participants who had a weaker athletic identity stated that this made their transition easier because they already had the support system outside of athletics.

**Nature of the Injury**

Although each participant had a unique story regarding their injury, all identified three factors related to the nature of the injury which impacted their transition: 1) Prevalence of past recurring injuries, 2) Seriousness of the career-ending injury, and 3) The decision to not play.

**Prevalence of past recurring injuries**

Nearly all of the participants (6 of 7) experienced multiple injuries before their sport career officially came to an end. More specifically, five of the seven participants had been dealing with injuries for a considerable amount of time. Several participants also experienced multiple surgeries during their sport careers. For example, Dean reported a long history of dealing with concussions, the injury that ultimately ended his sport career. He stated that his first concussion occurred “in the fourth or fifth grade” and continued to plague him over the years. Two participants (Nicholle and Chase) had been injured on and off since they were 15 years old. In general, the experiences of having multiple
injuries allowed the athletes to be prepared for the end of their sport career, which generally made their transition easier. With each injury the athletes felt they were forced to accept that because they were prone to injuries, they may experience a premature end to their sport career.

**Seriousness of the career-ending injury**

All of the injuries reported by the participants were severe enough to end their careers; a few were even life-threatening. Generally, the transition out of sport was *facilitated* when the injury was more life-threatening or physically debilitating. For these participants, being alive and healthy was much more important than a potential future in sports. The realization that an injury could end their life, or result in severe, life-long impairments, put into perspective how important it was for them to move on. Chase, for example, discussed the long-term effects of his career-ending injury. At only 25 years of age, the physical condition of Chase’s shoulder was diagnosed as one that resembled the shoulder of a 70 year old man. Chase described the long-term effects of his shoulder injury:

> My personal thing is my shoulder and not being able to lift 5 lbs. I know to be a hockey player you need the use of your shoulder. I’m 25 years old right now and what is going to happen when I’m older? Am I going to be able to hold my baby? It’s terrible; I already have arthritis.

Furthermore, two of the participants (Nicholle and Tyler) had injuries that resulted in hospitalization. Tyler’s injury resulted in a life-threatening situation. If surgery would not have been performed in time, Tyler’s head injury would have ultimately ended in death. In addition, Nicholle developed a severe staph infection after her ACL reconstruction surgery.

**The decision to not play**

Each of the participants’ decision to not play was extremely difficult and was based on the circumstances surrounding the injury. Four of the seven participants felt that they had no control over the decision to end their sport career. Tyler talked about his situation in a more positive light and thought this was a way for him to walk away without any regrets: “Here’s the nice thing about it. The decision to not play was made for me, so I can’t sit here and teeter about whether or not I should still be playing.” Whereas two of the participants (Chase and Dean) had to end their sport career due to doctors refusing to clear them because of the potential physical consequences if they continued to play.

The remaining participants ultimately had the final say in whether or not they continued their collegiate sport career. For each of these individuals, the final decision to not play was “tough to make.” These athletes knew they *could* continue to play, but also knew there was the potential of significant and negative physical long-term consequences. Lance, for example, explained his choice to end his career this way:

> It was my decision. I chose to stop playing because they said if I chose to play my last year it would take the rest of my meniscus and I’d have to have a fake knee within
the next 10 years. It was pretty much an overnight decision, where I finally decided that enough was enough...There was no way that I could play this last year knowing that I would permanently, severely jeopardize my health later on.

In sum, the majority of the participants experienced multiple injuries before the final injury that ended their sport career. Around half of the participants felt that they had no control over the decision to stop playing, whereas the other participants had to make the final decision to stop playing. For those who chose to discontinue playing, they struggled with weighing the long-term consequences of their injury with their desire to play. For these athletes, this internal struggle made the transition more difficult.

Pre-Retirement Planning

Two factors that emerged, which clarified if the participants had taken an active role in planning for the end of their sport career, included: 1) The timing of injury and 2) “Plan B.”

The timing of injury
The majority of athletes did not think about their future without sports until after the career ending injury occurred. One participant (Lance) who was injured later on in his sport career talked about not thinking “that far ahead” because he assumed he would have the whole season to plan for his future. When compared to the athletes who were injured during their last season of competition, those who were injured early in their collegiate sport career felt they had more time to prepare for life outside of sports. Furthermore, the participants that experienced multiple or reoccurring injuries did consider the end of their sport career and engaged in pre-retirement planning more frequently. In general, this made their transition easier. Chase, for instance, suggested that multiple injuries made him realize the importance of engaging in pre-retirement planning.

Every little injury, and every little thing…it just got tougher and tougher. I think then I started looking to the future. I’m a smart enough guy, I wanted to try and play hockey forever, but I knew either way it wasn’t going to go forever. I started mentally preparing for when I was done playing.

“Plan B.” Because the majority of the participants did not start planning for life after their sport career, they had not developed their “Plan B”. For those participants who did actively prepare for life after sport, the process of transition was seen as more positive; these former athletes recalled experiencing a shorter adjustment period when compared to those who did not develop an alternate plan. In general, most of the participants failed to prepare for life after sport because they did not “expect [their sport career] to go as fast as it [did]”. Lisa said that she did not take a practical approach to planning, stating: “I guess I always knew I should be getting ready, but I never did anything actively to actually get ready.”

Two participants had specifically developed a “Plan B” and both talked about this extensively during the interviews. Tyler and Anthony both knew the importance of
developing “ground work” in terms of setting up opportunities for their future. Tyler elaborated on his approach to “taking school seriously” and the importance to “prepare far earlier.” During Anthony’s interview, he also commented on how important it is to “build your resume” and start “looking for internships” well before the sport career ends. Anthony said that being prepared allowed him to have “more of a positive transition.” He shared his thoughts about developing a “Plan B”:

Always think about the real world; always have two plans. ‘Plan A’ being that you’re going to be that professional athlete; you’re going to control the world with your athletics and stuff. ‘Plan B’ meaning, you know, that sport is not always going to be there for you. Eventually you’re going to get tired, or get old; athletes are going to get quicker or faster than you. Your body playing for that long, time is going to take a toll on it. So you should always have a ‘Plan A’ and ‘Plan B.’

Overall, the majority of athletes did not think about their future without sports and had not developed a “Plan B” before their career-ending injury. Those who were injured early in their collegiate sport career felt they had more time to prepare for life outside of sports compared to those who were injured during their last season of competition.

**DISCUSSION**

Using the Conceptual Model of Adaptation to Career Transition (Taylor & Ogilvie, 1994; Taylor et al., 2006), the purpose of this study was to examine the psychosocial effects that accompany an athlete’s transition out of sport due to a career-ending injury. The current findings help to identify factors that contributed to how former collegiate athletes experienced the adjustment process; their reported experiences support portions of the Conceptual Model. The first two sections below reflect the purpose of the study.

**Psychosocial Effects**

The participants experienced a range of emotional, psychological, social, and behavioral effects during the adjustment process. For example, participants in the current study expressed a myriad of negative feelings such as sadness, devastation, anger, bitterness, helplessness and loss, to more positive feelings of appreciation and gratitude. The feelings the participants identified are consistent with the previous literature (Alfermann et al., 2004; Baillie, 1993; Blinde & Stratta, 1992; Koukouris, 1991; Lotysz & Short, 2004; Taylor et al., 2006).

Koukouris (1991) suggested that athletes experience initial stages of adjustment problems, but as time moves on the transition is viewed more positively. The majority (6 of 7) of athletes in this study initially struggled with their sport career ending, but eventually viewed their transition positively. Therefore, the current findings support the idea that negative feelings an athlete experiences after a career-ending injury gradually diminish over time. However, the current findings do indicate that the seriousness of a career-ending injury can impact the adjustment process. For example, the athlete (Tyler)
in this study who suffered a life-threatening injury was more accepting and realistic about ending his sport career. Certainly, more research is needed to confirm this finding.

About half of the athletes in the current study chose to stop competing. The pursuit of a career in sports was not worth the potential long-term health risks the injury could cause if they continued to play. The participants described the final decision as being “tough to make.” Researchers indicate that athletes who experience ambiguity about ending their sport career face more stress and difficulty when trying to accept their final decision (Kerr & Dacyshyn, 2000). Our findings support Kerr and Dacyshyn’s claim that a more difficult transition can arise when an athlete has to choose whether or not to retire. In addition, the athletes in the current study who reported a more difficult adjustment had a limited social identity that revolved around their sport. This finding supports previous research that suggested athletes with a high athletic identity experience more severe psychological difficulties (Erpic, Wylleman, & Zupancic, 2004) and greater degrees of emotional and social adjustment when they transition out of sport (Grove et al., 1997).

Support for the Conceptual Model of Adaptation to Career Transition

Interview data from the current study is found to support many components of Taylor and Ogilvie’s (1994) Conceptual Model. More specifically, these findings address Stages 2, 3, and 4.

Support for Stage 2 of the conceptual model

All of the factors related to the adaptation to career transition (developmental contributors, self-identity, perceptions of control, social identity, and tertiary factors) within Stage 2 of the Conceptual Model were addressed by the participants in this study. Developmental contributors, the first factor in Stage 2, are aspects of the athlete’s life that influenced their development since the beginning of their athletic careers (Taylor et al., 2006). Five out of the seven athletes in this study specifically discussed how sport was all they had ever done, and that their lives had a singular focus until their career-ending injury. Taylor and Ogilvie (1994) suggested that the most salient aspect of self-identity, which is the second factor within Stage 2, is athletic identity. The current findings support this area of the model since athletes who had a very strong identification to their role in sports experienced a more difficult time adjusting to the transition.

Social identity, the third factor within Stage 2, described as a broader identity including family, educational, occupational, and friendship aspects, was a salient feature during the transition for the athletes in this study. The two participants who had a balanced social identity, which consisted of both athletic and non-athletic factors, discussed how helpful the non-athletic social identity was to their transition. Tertiary contributors, the fourth factor within Stage 2, are those that are unique to the individual, yet still important in the athlete’s transition (Taylor et al., 2006). Some tertiary contributors that impacted the athletes in this study were their overall health and their years competing in their sport. Perceived control, the final factor in Stage 2, includes the athlete’s perception that she or he either chose to leave sport, or was forced out. Four of
the seven participants in this study felt like they had no choice but to stop competing in their sport; the remaining three had to first consider the long-term consequences of continued play. Despite previous literature on perceived control and the view that lack of control could contribute to a difficult transition (Blinde & Greendorfer, 1985), some of the athletes in this study reported relief that the final decision was made by their doctor(s). Therefore, if the decision is out of the athlete’s control, they may in fact experience less difficulty adjusting to the transition.

Support for Stage 3 of the conceptual model
As evident in Stage 3, the transition depends upon available resources utilized by the athletes, which include coping strategies, preretirement planning, and social support (Taylor et al., 2006). The athletes in the current study discussed the coping strategies that they utilized during their transition. While some participants discussed their grateful attitude as a coping strategy, others discussed how they changed focus towards their education and future careers. In fact, the participants in this study who had a “Plan B” experienced a smoother transition. Overall, the utilization of positive coping strategies and having a “Plan B” helped to facilitate their transition out of sport.

Social support, the next element of Stage 3, is another key component that fostered a smooth transition out of sport. Previous researchers have found that social support during the transition process is essential (Grove et al., 1997; Stephen et al., 2003). The athletes in this study reported that social support from family, coaches, teammates, friends, peers, professors, and the community contributed to a healthy adjustment. Being surrounded by a positive environment increased the ability to transition more smoothly. Furthermore, athletes who transition due to career-ending injuries without the presence of adequate support experience more psychological, emotional, and physical distress while trying to adapt to their life outside of college athletics.

Support for Stage 4 of the conceptual model
The fourth stage of the Conceptual Model addresses the overall quality of the career transition. Within this stage, career transition distress, intervention, and whether or not the transition was considered “healthy” are considered. As supported by the findings of this study, the more favorable the athlete experienced components from Stages 2 and 3, the healthier their transition out of sport (Taylor et al., 2006).

As Tyler’s situation illustrates, he had many of the necessary components in Stage 2 and 3 that facilitated a positive transition. Tyler recollected having a strong social identity during his athletic career, as he developed both personally and socially beyond the realm of athletics. Tyler’s athlete identity, in fact, was lower in comparison to the majority of the participants in this study. Tyler recalled his transition after the career ending injury as easier because his life did not completely center on hockey. Furthermore, Tyler coped with his transition by accepting his situation, utilizing social support, and planning for his career after athletics far in advance.

For athletes such as Lisa who lacked specific factors from Stages 2 and 3, the overall quality of the transition was less positive. Lisa lacked a strong social identity and rated herself at the highest level of athletic identity. Lisa’s social network only revolved around
the athletes on her team. When Lisa was forced to transition away from soccer, she had to re-develop her social network. Lisa severely lacked social support and failed to engage in pre-retirement planning, both which led to a more difficult adjustment.

**Implications**

There are multiple findings that are unique to this study and provide implications for coaches, sport psychology consultants, and other professionals who work with athletes. First, as several of the athletes discussed, having a “Plan B” allowed for a smoother transition. Sport psychology consultants and coaches can help all their athletes develop a “Plan B” or contingency plan regardless if they think they may experience a career-ending injury. It is imperative for athletes at all levels to understand that there will come a day when their sport career will end; they need to prepare accordingly.

Second, the findings of this study suggest that when athletes do not have control over the decision to play (i.e., the physician has made the decision for them), this allowed for an easier transition. The athletes who experienced a life-threatening injury also appeared to adjust easier because they had an appreciation for life and were less focused on their ability to not play. Physicians, coaches, and sport psychology consultants should recognize that the lack of control over the decision and the severity of the injury can impact the athlete’s transition. If the physician makes the final decision for the athlete to not play, an easier transition may follow.

Third, the findings of this study point to the importance of social support during an athlete’s transition out of sport. In fact, the importance of social support was one of the most prominent themes that emerged from the study. When working with athletes who have experienced a career-ending injury, coaches and sport psychology consultants can not only provide social support to the athlete, but should suggest the athlete turn to family members, friends, and teammates to ease their transition.

**Limitations and Future Research Directions**

Additional research is needed to confirm the findings of this study. Since this study only included seven participants, future research could examine the psycho-social effects of athletes’ transition out of sport with a larger population. In addition, this study only included athletes from limited sports; future research should include athletes from a variety of sport to examine the potential for sport-specific transitions. Additionally, this study only examined collegiate athletes. High school and/or professional athletes may have different experiences during their transition out of sport. Professionals working with athletes need to understand the transition process of athletes who have experienced a career-ending injury at all levels of participation (i.e., elite non-professional, professional, high school) and of athletes from different sports.

A limitation of the current study is that the athletes experienced a variety of injuries. An athlete’s experience may depend on what type of career ending injury they suffer. Researchers could consider future research that examines transitions based on the type of
injury. Furthermore, one athlete (i.e., Tyler) in this study experienced a life-threatening career-ending injury while playing. There appeared to be a difference in his transition compared to others, indicating the need for future research specific to life-threatening injuries.

REFERENCES


WARMING UP AND STAYING LOOSE: THE PREVALENCE, STYLE, AND INFLUENCE OF PREPARTYING BEHAVIOR AND DRINKING GAMES AMONG INTERCOLLEGIATE ATHLETES

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Loyola Marymount University, Department of Psychology, MD, USA

Abstract

This study investigates the prevalence and influence of prepartying behavior along with the co-occurrence of drinking game participation among a sample of Division 1 student-athletes (N = 568) from two institutions. Results indicate that 67% (n = 382) of the sample had prepartied in the past month, with 36% (n = 205) of the overall sample also having typically played drinking games in that context. Individuals that typically played drinking games while prepartying reported higher risk on the main outcome variables of overall past month alcohol consumption, prepartying-specific drinking behavior, and negative alcohol-related consequences than the prepartying-only group, which in turn evidenced higher consumption and risk when compared to the non-prepartying group. Moreover, males, as compared to females, demonstrated elevated scores on all outcome variables. Implications include the potential to help inform both prevention and intervention efforts among student-athletes.

Keywords: prepartying, student-athletes, alcohol use, drinking games, alcohol consequences

Nationwide research indicates that intercollegiate athletes consume more alcohol, engage in more frequent heavy episodic drinking [defined as having four (female) or five (male) drinks in one sitting], and experience more negative alcohol-related consequences compared to non-athletes (Leichliter, Meilman, Presley, & Cashin, 1998; Nelson & Wechsler, 2001; Wechsler, Davenport, Dowdall, Grossman, & Zanakos, 1997). Overall prevalence rates for alcohol consumption among student-athletes have been found to be between 80% and 87% (for review see Martens, Dams-O’Conner, & Beck, 2006). These statistics are particularly alarming in light of athletic performance detriments associated with the more acute use of alcohol. Alcohol consumption decreases the use of glucose and amino acids by skeletal muscles, adversely affecting energy supply and impairing the metabolic process during exercise (for review see El-Sayed, Ali, & El-Sayed, 2005).

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Small to moderate amounts of alcohol—that is, even less than the amount necessary to cause intoxication—impair reaction time, hand-eye coordination, accuracy, balance, and gross motor skills (American College of Sports Medicine; ACSM; 1982). Furthermore, disturbances in cardiovascular function are present during the hangover phase and include increased heart rate, decreased left ventricular performance, and increased blood pressure (Kupari, 1983). Such disturbances have been shown to significantly alter aerobic performance by 11.4% (O’Brien, 1993). Clearly, alcohol use engenders a certain measure of risk for athletes. Yet despite the rigorous training, time commitments, and performance standards demanded of intercollegiate athletes, little research exists on the types of context-specific drinking events that may increase their propensity to consume alcohol at risky levels and the psychosocial consequences that might subsequently arise.

Two such contexts that may independently and concurrently heighten risk for heavy drinking and negative alcohol-related consequences are prepartying and playing drinking games. Characteristics of each of these activities suggest a temporal distinction between the two. Drinking games can be played at any point during a drinking episode whereas prepartying, by definition, occurs prior to attending an activity or event at which more alcohol may or may not be consumed. Therefore, it is of value to delineate between the two as well as assess any potential additive or synergistic effects that may result during the co-occurrence of both. Garnering an understanding of their role and risk in drinking behavioral patterns of student-athletes can aid coaches, educators, and other athletic personnel in delivering effective alcohol and performance awareness education. Thus, the current study seeks to examine the extent to which student-athletes engage in prepartying and the extent to which drinking games are typically involved in prepartying. The study also attempts to determine whether engaging in those high-risk drinking contexts differentially influences one’s prepartying-related drinking behaviors, past-month drinking behaviors, athlete-specific drinking motives, and negative alcohol-related consequences.

Prepartying is a recently identified high-risk behavior that involves the consumption of alcohol prior to attending a planned event or activity (e.g. party, bar, concert, sporting event) at which more alcohol may or may not be consumed (Pedersen & LaBrie, 2007). This behavior is also referred to as “pregaming,” “front-loading,” or “pre-funking” depending on regional locale or group-specific vernacular. Arriving at a social event already under the influence (i.e. “buzzed”), saving money, and making the night more interesting have been found to be the most highly endorsed reasons for prepartying among both male and female college students (Pedersen, LaBrie, & Kilmer, 2009). Interestingly, a comparative analysis showed that men were more likely to endorse the activity as a means to increase social and sexual facilitation with opposite sex peers. When prepartying, individuals have been found to consume more drinks and are more likely to engage in heavy episodic drinking compared to non-prepartying days, and prepartyers endorse higher rates of negative alcohol-related consequences than non-prepartyers (Pedersen & LaBrie, 2007). Despite the elevated risks associated with prepartying and the fact that student-athletes have been identified as a high-risk group relative to other college student drinkers, no studies to date have examined prepartying behaviors among this important subgroup.
Prepartying is distinguished from another risky drinking context, playing drinking games, which has received considerable research attention (for review see Borsari, 2004). The shared goal among all drinking games is to get the participants intoxicated in a relatively short amount of time. Drinking games involve a “reversal of competence” in which the longer the game is played, players become more intoxicated, whereby decreasing their skills; this often results in players consuming larger amounts of alcohol than originally intended (Green & Grider, 1990). Indeed, participation in drinking games is consistently associated with excessive alcohol consumption (Borsari, 2004; Zamboanga, Letkowski, Rodriguez, & Cascio, 2006) and a higher risk of experiencing negative alcohol-related consequences (Adams & Nagoshi, 1999; Johnson & Cropsey, 2000).

Intercollegiate athletes are a specific group of students known to exist in a somewhat isolated environment that is often heavily reliant on the inter-athletic community for both social support and social activity (Martens et al., 2006). The nature of this isolation highlights the need for targeted research towards a greater understanding of how high-risk drinking contexts, such as drinking game playing and prepartying, may differentially impact drinking patterns of intercollegiate athletes. For example, certain aspects of drinking games may hold an intuitive appeal to athlete drinkers. Many drinking games rely on hand-eye coordination to perform motor tasks. Other games are more team oriented, involving winners, losers, and spectators (Borsari, 2004); an environment akin to the realm of intercollegiate sports. Qualitative research indicates that two of the most common reasons for playing drinking games include meeting new people and competition (Newman, Crawford, & Nellis, 1991). These seem especially applicable to student-athletes. The opportunity to engage in an enjoyable, competitive activity that promotes social interaction with persons outside the immediate social group, while potentially playing to one’s strengths, may be an attractive proposition for a college athlete.

Research examining participation in drinking games as a function of athletic status has been sparse yet indicative of heightened risk. For example, female intercollegiate athlete’s participation in drinking games was found to positively relate to negative alcohol-related consequences (Zamboanga, Bean, Pietras, & Pabon, 2005). Game playing has also been shown to mediate the relationship between student-athlete status and alcohol consumption and partially mediate the relationship between student-athlete status and negative alcohol-related consequences (Grossbard, Geisner, Neighbors, Kilmer, & Larimer, 2007). These studies suggest an important and differential impact of drinking games as a risk factor in this population. Due to reports of elevated risk and negative performance implications, alcohol use and abuse among student-athletes is an important concern for many educators and athletic department personnel. Yet no studies to our knowledge have examined the impact of prepartying among student-athletes and little research exists with respect to drinking games among this population. Moreover, no research to date has examined the relative impact of the co-occurrence of these activities on alcohol-related outcomes.

Although prepartying and drinking games are distinct high-risk drinking activities, they are not mutually exclusive and qualitative research indicates that drinking games are
frequently played for the purpose of prepartying (DeJong & DeRicco, 2007). However, prepartying can occur without drinking games. Students may simply prefer to drink without the context of drinking games prior to going to their planned destination. In light of research indicating elevated consumption levels and associated harms of these independent activities, it was anticipated that student-athletes who typically play drinking games while prepartying would demonstrate the highest levels of alcohol-related risk, followed by those who only engage in prepartying (sans drinking games), and that the lowest relative level of risk would be present among those who do not report engaging in either activity. To provide further insight into the prevalence of specific negative alcohol-related consequences experienced within each prepartying status group, individual items comprising the consequence measure are separately examined. It was hypothesized that the proportion of student-athletes who have encountered negative consequences would tend to be lowest in the non-prepartying group, relatively higher in the prepartying-only group, and highest in the prepartying group that partook in drinking games, with the more hazardous consequences experienced significantly more in the prepartying with games group. Finally, males typically consume more alcohol than females and this is consistent within the sub-population of collegiate athletes, particularly in terms of binge drinking rates and typical drinks consumed per week (see review by Martens et al., 2006). Therefore, all outcome variables are examined as a function of gender. It was hypothesized that males would demonstrate significantly higher risk on all study variables relative to females.

**METHOD**

**Participants**

A local institutional review board approved the current study, which was part of a larger social norms project designed to reduce perceived norms, alcohol consumption, and pro alcohol-related attitudes in intercollegiate student-athletes (LaBrie, Hummer, Huchting, & Neighbors, 2009). In total, 657 student-athletes from two geographically opposite universities in the United States were recruited to participate. Of these, 610 athletes completed the study, yielding a recruitment rate of 92.8%. Complete non-missing data were provided by 568 (93.1%) individuals, the final sample for all the analyses. The number of participants from each site was approximately even, with 273 athletes participating from a private mid-size university on the west coast and 295 athletes participating from a private mid-size college on the east coast. All athletes competed at the National Collegiate Athletic Association (NCAA) Division 1 level at their respective institutions. The mean age of respondents was 19.59 (SD = 1.34) and a slight majority were female (55.5%; n = 315). Finally, the majority of the sample (82.6%; n = 469) reported drinking at least once a month, on average. A description of participant characteristics is contained in Table 1.
Table 1. Participant Characteristics

<table>
<thead>
<tr>
<th>Background Variable</th>
<th>n</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>315</td>
<td>55.5</td>
</tr>
<tr>
<td>Male</td>
<td>253</td>
<td>44.5</td>
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<td><strong>Ethnicity</strong></td>
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<td>453</td>
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</tr>
<tr>
<td>Latino</td>
<td>39</td>
<td>6.9</td>
</tr>
<tr>
<td>Black</td>
<td>26</td>
<td>4.6</td>
</tr>
<tr>
<td>Asian</td>
<td>16</td>
<td>2.8</td>
</tr>
<tr>
<td>Native American</td>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>Mixed/Other</td>
<td>29</td>
<td>5.1</td>
</tr>
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<td><strong>Class Year</strong></td>
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<td></td>
</tr>
<tr>
<td>Freshmen</td>
<td>207</td>
<td>36.4</td>
</tr>
<tr>
<td>Sophomores</td>
<td>134</td>
<td>23.6</td>
</tr>
<tr>
<td>Juniors</td>
<td>136</td>
<td>23.9</td>
</tr>
<tr>
<td>Seniors</td>
<td>82</td>
<td>14.5</td>
</tr>
<tr>
<td>Fifth year</td>
<td>10</td>
<td>1.7</td>
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<tr>
<td><strong>Sport</strong></td>
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<td></td>
</tr>
<tr>
<td>Crew</td>
<td>98</td>
<td>17.2</td>
</tr>
<tr>
<td>Track/cross country</td>
<td>74</td>
<td>13</td>
</tr>
<tr>
<td>Soccer</td>
<td>73</td>
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<td>Lacrosse</td>
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<td>12</td>
</tr>
<tr>
<td>Swimming</td>
<td>63</td>
<td>11.1</td>
</tr>
<tr>
<td>Basketball</td>
<td>40</td>
<td>7.1</td>
</tr>
<tr>
<td>Tennis</td>
<td>34</td>
<td>5.9</td>
</tr>
<tr>
<td>Baseball</td>
<td>31</td>
<td>5.4</td>
</tr>
<tr>
<td>Water polo</td>
<td>25</td>
<td>4.4</td>
</tr>
<tr>
<td>Volleyball</td>
<td>25</td>
<td>4.4</td>
</tr>
<tr>
<td>Cheer</td>
<td>16</td>
<td>2.9</td>
</tr>
<tr>
<td>Softball</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Golf</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td><strong>Athletic Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In season</td>
<td>347</td>
<td>61.1</td>
</tr>
<tr>
<td>Not in season</td>
<td>221</td>
<td>38.9</td>
</tr>
</tbody>
</table>

**Procedure**

Permission was granted from the athletic directors at both sites, prior to initiating the study and contacting athletic team coaches. In the spring 2007 semester, coaches from all athletic teams were contacted and introduced to the project. They were told that their teams were invited to participate in a study about alcohol use and that it would fulfill alcohol programming requirements from their respective Athletic Departments. Every coach agreed to allow players the opportunity for participation and provided a team roster with members’ email addresses. An electronic protocol explaining the parameters of the study, consent form,
and link to the survey was emailed to each student-athlete, who then electronically consented to the study before being directed to the survey itself. The consent form contained assurances of confidentiality, specifying that nothing about individual or specific team responses would be communicated to any administrative university personnel, including coaching staff.

**Measures**

*Demographic items*

The survey began with an assessment of demographic variables that included age, gender, class year, ethnicity, sport-type membership and whether their sport was currently “in-season” (defined as currently involved in intercollegiate matches or games at the time of the survey).

*Alcohol use behavior*

Before answering questions about drinking behavior, participants were presented with the definition of a standard drink (defined as a drink containing one-half ounce of ethyl alcohol — one 12 oz. beer, 8 oz. of malt liquor, one 4 oz. glass of wine, or one 1.25 oz. shot) (Wechsler et al., 2002). Pictures of standard drinks accompanied these descriptions. A series of quantity/frequency measures (e.g., Dimeff, Baer, Kivlahan, & Marlatt, 1999) were used to assess for alcohol consumption in the past 30 days. For the purposes of this study we focused on peak number of drinks on any one occasion over the preceding 30 days (i.e. maximum drinks), number of heavy episodic drinking episodes over the previous two weeks (5+ drinks on one occasion for men; 4+ drinks on one occasion for women) (i.e. binge episodes), the average amount consumed per drinking occasion (i.e. average drinks), and the number of days over the prior 30 days in which alcohol was consumed (i.e. drinking days). We chose these measures to encompass average alcohol consumption (average drinks and average days) and heavy or high-risk consumption (maximum and binge episodes).

*Prepartying and drinking game status*

Prepartying was first defined as “the consumption of alcohol prior to attending an event or activity [e.g., party, bar, concert] at which alcohol may or may not be consumed.” All participants were then presented with the open-ended question, “In the past 30 days, how many days did you engage in prepartying?” (Pedersen & LaBrie, 2007). Individuals answering with a ‘0’ were categorized as “non-prepartying.” Those who prepartied were asked, “In what way did you typically preparty?” Response options were as follows: 1 (Alone, while getting ready to go out); 2 (With friends/roommates while getting ready to go out); 3 (Playing drinking games); 4 (Other). Participants who reported that they typically played drinking games while prepartying were categorized as “prepartying with drinking games.” All other participants who prepartied were categorized as “prepartying without drinking games.”
Prepartying drinking behavior
All participants that reported at least one occasion of prepartying in the past month were presented with an open-ended self-report question of prepartying drinking behavior (e.g. Pedersen & LaBrie, 2007). They were presented with the question: “On average, how many drinks did you consume while prepartying?” This variable was named ‘preparty average drinks’ for all analyses. The variable ‘preparty drinking days’ refers to the number of days the participant reported on the opening preparty question assessing frequency in the past 30 days.

Athlete drinking scale
The 19-item Athlete Drinking Scale (ADS; Martens, Watson, Royland, & Beck, 2005) was administered to participants as a measure of sport-related reasons for intercollegiate athlete alcohol use. The ADS includes three subscales: (a) Positive Reinforcement (α = 0.94; e.g., “After a game/match/meet, it is important for me to go out and celebrate with alcohol”), (b) Team/Group (α = 0.92; e.g., “I feel pressure from my teammates to drink alcohol”), and (c) Sport-Related Coping (α = 0.85; e.g., “I drink to help me deal with poor performances”). Participants are asked to indicate whether or not they agree with each statement regarding reasons for drinking, with responses scored on a six-point scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). Responses are averaged to create a score for each subscale. The ADS has demonstrated good reliability and validity in measuring the construct of sport-related drinking motives (Martens, LaBrie, Hummer, & Pedersen, 2008).

Alcohol consequences
Negative alcohol-related consequences were assessed using the Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ: Kahler, Strong, & Read, 2005). The BYAACQ is a 24-item measure that is an outgrowth of other alcohol use measures (Hurlbut & Sher, 1992; Miller, Tonigan, & Longabaugh, 1993). Participants are asked to indicate via a yes/no format whether or not they have experienced each alcohol-related problem in the past month (e.g., “My drinking has gotten me into sexual situations I later regretted;” “I have felt badly about myself because of my drinking” – See Table 3 for a complete list of items). “Yes” responses are summed to create a total score on the measure. Validity analyses among college students indicate that the measure discriminates across the entire alcohol problems continuum (Kahler et al., 2005). In the current study the internal consistency was excellent (α = 0.92).

RESULTS
Data Analysis
Primary analyses entailed 2 (gender) x 3 (prepartying status) factorial ANOVA models. Serving as the dependent measures were preparty drinks (drinking days and average drinks), overall drinks (drinking days, average drinks, maximum drinks, and binge episodes), ADS subscales (Positive/Reinforcement, Team/Group, Sport-Related Coping),
and alcohol-related negative consequences (BYAACQ). Specifically, across gender, main effects assessed mean differences between females and male. Across prepartying status, main effects examined mean differences between the groups classified as non-prepartying, prepartying without games, and prepartying with games. If the omnibus main effect for prepartying status was demonstrated to be statistically significant, mean scores of each of the three prepartying groups were subsequently examined via $t$ test contrasts. Statistically significant interactions found between the gender and prepartying status factors were graphed.

To provide insight into the prevalence of specific alcohol-related negative consequences experienced within each gender group and within each prepartying status group, the 24 items from the BYAACQ scale were separately examined. In the response options for the BYAACQ scale, athletes responded with either a *yes* or *no* to whether they have personally experienced each negative consequence. As such, the most appropriate analyses for this purpose were frequency-based tests, particularly chi-square tests and tests of proportions between two independent groups. We conducted overall chi-square tests involving each specific consequence with gender, as well as with prepartying status. As the comparison across prepartying status involves three groups, a statistically significant omnibus chi-square result was subsequently decomposed with tests of independent proportions between each combination of two groups. All analyses were tested using a conservative significance level of $p < 0.01$.

### Demographic Differences

Athletes were categorized into one of three mutually exclusive and exhaustive prepartying status classifications: non-prepartying (32.7%, $n = 186$), prepartying without drinking games (31.2%, $n = 177$), prepartying with drinking games (36.1%, $n = 205$). Across these three prepartying status groups, no statistical differences were found on age or season of sport. Caucasian (vs. non-Caucasian) athletes were significantly more likely to preparty without or with drinking games than not to preparty, $p < 0.01$. A statistically significant chi-square test was found between gender and prepartying status, $p < 0.01$, such that among males, there were 30.0% ($n = 76$) non-prepartying, 26.9% ($n = 68$) prepartying without games, and 43.1% ($n = 109$) prepartying with games; among females, the distribution was more even, with 34.9% ($n = 110$) non-prepartying, 34.6% ($n = 109$) prepartying without games, and 30.5% ($n = 96$) prepartying with games.

### Mean Differences on Preparty Drinks, Overall Drinks, and ADS

As presented in Table 2, gender effects show that males reported significantly higher mean scores than females on every outcome measure, including all measures of preparty drinks, all measures of overall drinks, ADS subscales, and BYAACQ, $ps < 0.01$. Concerning prepartying status (Table 2), the prepartying with games group reported higher means on all measures of preparty drinks, all measures of overall drinks, the ADS subscale of positive reinforcement, and BYAACQ than the prepartying without games.
group, which in turn reported higher scores on these same measures than the non-prepartying group, \( p < 0.01 \). A slightly different pattern of results was found on two ADS subscales, such that no difference emerged between the prepartying with games and the prepartying without games groups on team/group and sport-related coping, \( ns \), but both groups still reported higher scores on these subscales than the non-prepartying group, \( p < 0.01 \).

Significant Gender x Prepartying status interactions were discovered on preparty average drinks, \( F(2, 562) = 14.01, p < 0.01 \), overall average drinks, \( F(2, 562) = 9.15 \), and overall maximum drinks, \( F(2, 562) = 14.21, p < 0.01 \). These interactions, graphed in Figure 1, detail that males scored higher than females, and that participants prepartying with games were most at risk while non-prepartying participants were least at risk. The gender gap in these drinking outcomes becomes increasingly pronounced when sequentially shifting in drinking habits from non-prepartying to prepartying with games.

Figure 1. Gender x Prepartying Status on preparty average drinks, overall average drinks, and overall maximum drinks.
<table>
<thead>
<tr>
<th>Measure</th>
<th>Female</th>
<th>Male</th>
<th>Univariate F test</th>
<th>Prepartying Status</th>
<th>Univariate F test</th>
<th>η²</th>
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<td><strong>Preparty Drinks</strong></td>
<td></td>
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<tr>
<td>Drinking Days</td>
<td>2.51</td>
<td>3.46</td>
<td>3.99</td>
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<td>3.51</td>
<td>.02</td>
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<tr>
<td>Average Drinks</td>
<td>2.04</td>
<td>3.27</td>
<td>2.83</td>
<td>37.36*</td>
<td>1.11</td>
<td>.06</td>
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<tr>
<td><strong>Overall Drinks</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>4.44</td>
<td>5.69</td>
<td>4.57</td>
<td>13.27*</td>
<td>3.28</td>
<td>.02</td>
</tr>
<tr>
<td>Average Drinks</td>
<td>4.08</td>
<td>6.12</td>
<td>4.09</td>
<td>40.23*</td>
<td>2.23</td>
<td>.07</td>
</tr>
<tr>
<td>Maximum Drinks</td>
<td>6.57</td>
<td>10.62</td>
<td>7.18</td>
<td>69.67*</td>
<td>3.97</td>
<td>.11</td>
</tr>
<tr>
<td>Binge Episodes</td>
<td>1.05</td>
<td>1.66</td>
<td>1.87</td>
<td>20.09*</td>
<td>0.27</td>
<td>.03</td>
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<td>Positive Reinforcement</td>
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<td>.04</td>
</tr>
<tr>
<td>Team/Group</td>
<td>1.88</td>
<td>2.35</td>
<td>1.19</td>
<td>29.92*</td>
<td>1.49</td>
<td>.05</td>
</tr>
<tr>
<td>Sport-Related Coping</td>
<td>1.75</td>
<td>2.14</td>
<td>1.22</td>
<td>18.36*</td>
<td>1.30</td>
<td>.03</td>
</tr>
<tr>
<td><strong>BYAACQ</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative consequences</td>
<td>4.26</td>
<td>6.08</td>
<td>4.77</td>
<td>15.91*</td>
<td>2.53</td>
<td>.03</td>
</tr>
</tbody>
</table>

*Note.* Within prepartying status, means in the same row not sharing a subscript are statistically different at $p < .01$.  
$\eta^2 =$ eta squared (effect size)  
*$p < .01$
Table 3. Proportion of Specific Alcohol-Related Negative Consequences (BYAACQ) as a Function of Gender and Prepartying Status

<table>
<thead>
<tr>
<th>Measure</th>
<th>Gender</th>
<th>Prepartying Status</th>
<th>Non-Prepartying</th>
<th>Prepartying w/o Games</th>
<th>Prepartying w/ Games</th>
<th>X² test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have had a hangover (headache, sick stomach) the morning after I had been drinking.</td>
<td>.53 .54 .06</td>
<td>.22 .58 .78</td>
<td>125.67*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I have taken foolish risks when I have been drinking.</td>
<td>.31 .44 .06</td>
<td>.17 .34 .58</td>
<td>71.05*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I've not been able to remember large stretches of time while drinking heavily.</td>
<td>.23 .34 .06</td>
<td>.12 .19 .49</td>
<td>73.80*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The quality of my work or school work has suffered because of my drinking.</td>
<td>.12 .19 .07</td>
<td>.07 .18 .21</td>
<td>16.68*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I have had less energy or felt tired because of my drinking.</td>
<td>.43 .41 .20</td>
<td>.52 .53 .52</td>
<td>52.39*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. My drinking has gotten me into sexual situations I later regretted.</td>
<td>.14 .27 .12</td>
<td>.15 .31 .31</td>
<td>27.27*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I often have ended up drinking on nights when I had planned not to drink.</td>
<td>.23 .35 .15</td>
<td>.29 .39 .39</td>
<td>27.88*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. My physical appearance has been harmed by my drinking.</td>
<td>.08 .14 5.82</td>
<td>.05 .12 .14</td>
<td>9.68*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. While drinking, I have said or done embarrassing things.</td>
<td>.44 .47 .19</td>
<td>.53 .63 .63</td>
<td>82.11*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I have felt very sick to my stomach or thrown up after drinking.</td>
<td>.30 .28 .18</td>
<td>.31 .39 .39</td>
<td>20.66*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.</td>
<td>.10 .18 .08</td>
<td>.16 .17 .17</td>
<td>8.71*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. When drinking, I have done impulsive things I regretted later.</td>
<td>.19 .32 13.36*</td>
<td>.10 .26 .38</td>
<td>42.00*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I have been overweight because of drinking.</td>
<td>.07 .11 3.48</td>
<td>.05 .09 .11</td>
<td>4.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I have woken up in an unexpected place after heavy drinking.</td>
<td>.09 .19 13.15*</td>
<td>.05 .09 .25</td>
<td>36.13*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I have spent too much time drinking.</td>
<td>.08 .14 5.15</td>
<td>.05 .10 .17</td>
<td>12.75*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I have felt badly about myself because of my drinking.</td>
<td>.17 .17 .00</td>
<td>.14 .14 .21</td>
<td>4.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.</td>
<td>.11 .17 4.62</td>
<td>.08 .13 .20</td>
<td>11.78*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).</td>
<td>.03 .09 10.26*</td>
<td>.05 .07 .05</td>
<td>0.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I have driven a car when I knew I had too much to drink to drive safely.</td>
<td>.07 .15 8.80*</td>
<td>.08 .12 .11</td>
<td>1.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I have neglected my obligations to family, work, or school because of drinking.</td>
<td>.05 .14 12.01*</td>
<td>.06 .08 .13</td>
<td>6.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. I have often found it difficult to limit how much I drink.</td>
<td>.11 .21 8.92*</td>
<td>.09 .14 .23</td>
<td>15.65*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. I have passed out from drinking.</td>
<td>.16 .29 15.51*</td>
<td>.09 .15 .39</td>
<td>55.88*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I have become very rude, obnoxious, or insulting after drinking.</td>
<td>.10 .24 19.00*</td>
<td>.08 .16 .23</td>
<td>16.94*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.</td>
<td>.13 .26 14.82*</td>
<td>.08 .15 .33</td>
<td>42.44*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Within prepartying status, proportions in the same row not sharing a subscript are statistically different at p < .01. *p < .01.
Mean differences on Negative Alcohol-Related Consequences Composite

As evidenced in Table 2, mean differences were found across genders and all three prepartying groups on the BYAACQ composite. A gender main effect showed that males ($M = 6.08, SD = 6.12$) experienced more negative consequences overall than females ($M = 4.26, SD = 4.77$), $F(1, 562) = 10.95, p < 0.001$. A main effect was observed for prepartying status, such that participants prepartying with games ($M = 7.39, SD = 5.47$) experienced a greater number of consequences than participants prepartying without games ($M = 5.06, SD = 4.77$), which was greater than the non-prepartying group ($M = 2.53, SD = 5.01$), $F(2, 562) = 42.14, p < 0.001$. The influence of both gender and prepartying on total negative consequences is depicted in Figure 2.

Figure 2. Gender x Prepartying Status on alcohol consequences (BYAACQ).

Proportion Differences on Specific Alcohol-Related Negative Consequences

Items on the BYAACQ scale were further scrutinized to investigate group-based systematic differences for each particular type of risk. Table 3 contains findings for each specific consequence experienced as a function of gender and prepartying status group. In terms of gender, 14 of the 24 items were significantly different, all in the direction of a greater proportion of males experiencing the negative consequence, $p$s < 0.01. In terms of prepartying status, proportion differences in experiencing a consequence between at least two groups were exhibited on 19 of the 24 items, $p$s < 0.01. Generally, the proportion of
athletes who have encountered negative consequences tended to be lowest in the non-prepartying group and highest in the prepartying group playing drinking games.

Specifically (Table 3), in comparison to the non-prepartying cohort, the pre-partying without games cohort was significantly more likely to have experienced a hangover in the morning, taken foolish risks, indicated that their quality of work had suffered, felt tired, done embarrassing things, felt sick or thrown up, and done impulsive things, \( p_s < 0.01 \). Compared to the prepartying without games cohort, the prepartying with games cohort was significantly more likely to have experienced a hangover, taken foolish risks, not remembered large stretches of time, gotten into regretful sexual situations, woken up in an unexpected place, passed out, and needed larger amounts of alcohol for the same effect, \( p_s < 0.01 \).

**Additional Analyses**

Further analyses explored differences in measures of overall drinks based on classification of the sport into individual or team-based. Athletes engaging in team sports reported significantly higher mean scores on average drinks and maximum drinks, \( p_s < 0.01 \), but not drinking days or binge episodes, \( ns \). In team sports, athletes reported 5.35 \((SD = 4.19)\) average drinks, 8.93 \((SD = 6.11)\) maximum drinks, 5.06 \((SD = 3.95)\) drinking days, and 1.41 \((SD = 1.65)\) binge episodes. In individual sports, athletes reported 4.13 \((SD = 3.18)\) average drinks, 7.08 \((SD = 5.81)\) maximum drinks, 4.85 \((SD = 4.41)\) drinking days, and 1.11 \((SD = 1.67)\) binge episodes.

**DISCUSSION**

The current study assessed the prevalence of prepartying behavior among a sample of student-athletes as well as the relative impact of the co-occurrence of prepartying and game playing on subsequent drinking behavior and consequences. Results indicated that the majority of student-athletes have prepartied in the past month (67%), with 36% of the overall sample also having typically played drinking games in that context. Such a high prevalence of engaging in a risk-related behavior holds important implications as well as highlights the need to address this phenomenon. A primary hypothesis of the current research was that alcohol use and negative consequences would differ as a function of both gender and whether an individual athlete engages in prepartying, does not engage in prepartying, or typically plays drinking games while prepartying. This hypothesis was strongly supported. Several notable distinctions emerged that provide useful information to help inform both prevention and intervention efforts among student-athletes.

First, results indicated that as expected, male athletes reported significantly more overall drinking on past month drinking variables as well as greater average drinks while prepartying and more frequent prepartying than their female counterparts. This pattern also held consistent across prepartying groups. That is, individuals within the prepartying/drinking games group drank more both overall and while prepartying than the prepartying-only group, which drank more than the non-prepartying group. Furthe-
more, interactions between gender and prepartying status revealed that males’ trajectories differed from females’ on the variables of average drinks while prepartying, average drinks during a typical occasion in the past month, and maximum drinks consumed at one time in the past month. Thus, the context of the prepartying/games combination seems to be associated with heavier drinking, particularly among these male athletes. Prepartying in general and the combination of playing drinking games while prepartying are readily associated with increased risk for both male and female student-athletes in this sample. Thus, it behooves researchers and athletic personnel to target the risky context of prepartying and drinking games in the design of prevention and intervention initiatives.

Results on the Athlete Drinking Scale help clarify observed group differences with regards to drinking behavior. Of particular interest is that prepartying groups differed on the subscale of Positive Reinforcement. The prepartying/games group evidenced higher scores on this subscale than did the prepartying-only group, which was also higher than the non-prepartying group. Items on this subscale include stronger motives for drinking as a celebration for athletic victories or strong performance, drinking to get drunk, and drinking because they believe in the “work hard – play hard” lifestyle. Psychosocially, those who compete in drinking games may draw from them a similar sense of satisfaction and positive reinforcement that is associated with their sport, thus the higher scores on that subscale. Hence, drinking games may seem familiar, fun and, thus, more likely to be played. For example, as in collegiate athletics, drinking games hold a place for competition and camaraderie, for ups and downs, and for celebration of individual and team performance in both victory and defeat. Future research may benefit from assessing these constructs longitudinally to seek causality.

A further aim of the current study was to identify the level of risk for negative consequences in those who participate in prepartying and game playing. We hypothesized that both males and the prepartying/games group would experience more consequences and that, when examined individually, the more hazardous consequences would also be experienced significantly more by the prepartying/games group. This hypothesis was supported. Male athletes indeed reported higher consequences overall than females and those individuals in the prepartying/games group reported higher consequences than the prepartying-only group, which in turn reported higher consequences than the non-prepartying group. This association confirms the risk associated with prepartying and demonstrates the additive risk of playing drinking games when prepartying. Interestingly, although males significantly increased their drinking relative to females and as a function of group status, overall consequences did not significantly differ between males and females as a function of group status. It appears then that participating in drinking games while prepartying and prepartying in general, may more negatively impact female athletes relative to males with regard to negative consequences. This confirms and extends previous research demonstrating a positive relationship between drinking games and negative alcohol-related consequences among female intercollegiate athletes (Zamboanga et al., 2005).

To provide greater insight and further delineate the nature of the risk associated with the drinking contexts under consideration, efforts were made to examine proportions of
individual consequences as a function of group categorization. Results revealed trends consistent with the primary hypotheses of the study. Beginning with differences between genders, males endorsed fourteen consequences at a higher rate than females. Of particular interest though, were the proportioned differences between prepartying statuses. While there were many significant differences, for the sake of parsimony, only the strongest indicators of elevated risk are mentioned here. First, sequentially elevated risk was found between all three groups on the consequences of experiencing a hangover the morning after drinking and foolish risk-taking while drinking. Perhaps most concerning, are the elevated risks experienced by the prepartying with games group, relative to the other two groups. These include: not being able to remember large stretches of time while drinking heavily (blackouts), engaging in later regretted sexual situations, waking up in an unexpected place after heavy drinking, passing out from drinking, and finding that larger amounts of alcohol were needed to feel any effect or amounts that previously resulted in intoxication no longer did so (tolerance). These consequences underscore the seriousness of the prepartying/games drinking context and highlight the need to address this phenomenon in prevention efforts. Blacking out, regretted sexual intercourse, and tolerance are typically associated with rapid increases and high sustained levels of BAC, as well as potential alcohol dependence. These consequences are particularly salient for intercollegiate athletes, as they may strongly impede academic and physical performance as well as raise the likelihood for legal ramifications.

By identifying the most salient social and environmental factors influencing student-athletes’ drinking behaviors, progress can be made in an attempt to promote wellness and peak performance while minimizing negative consequences. Although not assessed in the current study, hazing is an important issue that may be tied to risky drinking behaviors and one that constitutes an avenue for future research. In a recent national study on student hazing practices, 74% of student-athletes reported experiencing at least one hazing behavior in their collegiate career (Allan & Madden, 2008). In addition, the most frequently reported hazing behavior among student-athletes was participating in drinking games (47%), followed closely by drinking large amounts of alcohol to the point of getting sick or passing out (23%). Social events promoting heavy drinking and characterized by rapid consumption, such as prepartying and involvement in drinking games, constitute the types of environmental and social contexts that may be conducive to hazing practices while further increasing the propensity for negative behavioral outcomes. It is suggested that administrators and researchers begin to assess the possible link between these drinking contexts and hazing, while creating novel ways to address these popular behaviors that lead to high-risk drinking and increased consequences.

Limitations exist in the current study. First, because the focus was on the styles and influences of prepartying behavior, an independent examination of drinking games was not included in these analyses. However, a thorough assessment of the distinct role of drinking games among intercollegiate athletes can be found elsewhere (Grossbard et al., 2007). Second, due to the cross-sectional nature of our data, the direction of the relationship between our study variables cannot fully be determined. For example, it is unclear what aspect of drinking results in greater consequences. We cannot infer
causation between prepartying or prepartying with games and the effect on negative consequences. It may be that other types of drinking episodes outside of these contexts account for the elevated consequences. Event-level assessment with the use of collateral informants would increase the validity of the data.

Despite these limitations, the current study provides important information that may potentially apply to the larger population of college student-athletes in terms of risky drinking. First, it determined that the drinking context of prepartying was prevalent and that athletes who prepartied drank more and had more negative consequences than those who did not preparty. Second, playing drinking games while prepartying was common among this sample of student-athletes (42% of males and 31% of females) and was linked to both increased consumption and experiencing negative consequences. Further, the student-athletes who typically played drinking games while prepartying experienced more of the most serious consequences that not only negatively impact academic and athletic performance but may lead to serious legal or health consequences including alcohol dependence. Thus, the results establish prepartying as an important context for college student-athlete substance use, one that requires further research as well as the attention of college personnel who work with these athletes.

REFERENCES


A COMPARISON OF PSYCHOSOCIAL AND ORTHOPEDIC DATA IN INJURED COLLEGE ATHLETES: A NOVEL APPLICATION OF HURDLE REGRESSION

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2West Virginia University, WV, USA

ABSTRACT

It was the purpose of this study to determine the influence of psychosocial mediators and baseline orthopedic data on injury in college athletes. We hypothesized that athletes with high life stress, competitive anxiety, and high orthopedic screening scores would incur more days missed due to injury. Hurdle regression analysis (HRA) was used to determine the influence of predictor variables on days missed due to injury in a sample of NCAA division II college athletes (n=177). Somatic anxiety (p=0.029), negative live stress (p=0.010), positive life stress (p<0.001), and orthopedic risk score (p=0.012) predicted days missed due to injury. These findings support previous research on the stress-injury relationship. The use of HRA advances this area in the injury literature as it accounts for over dispersion and unobserved heterogeneity in the sample.

Keywords: Stress, Anxiety, Orthopedic Screening, Hurdle Regression

INTRODUCTION

Seventy million injuries require one day or more of restricted activity in the United States annually, 44% of which occur from sport participation (Boyce & Sobolewski, 1989). Prevention of injury may help in reducing the associated physical and economic sequelae. In order to prevent injury, it is crucial that practitioners accurately identify those at risk.

Many etiological factors related to injury are easily recognized (e.g. trauma, overuse, or structural weakness); however, there are also less tangible precursors to injury, including environmental and psychosocial variables (e.g., anxiety, stress, etc). It is crucial that allied health practitioners be able to identify those at risk for injury, regardless of whether the risk is from physical or psychological predisposing factors. Research in the military arena has called for further investigation of preventative strategies including

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musculoskeletal injury risk modeling as no such index exists in the literature (Bullock, Jones, Gilchrist, & Marshall, 2010). Research is also needed that further identifies psychological risk factors for athletic injury as this area remains undeveloped (Elliot, Goldberg, & Kuehl, 2010; Steffen & Engebretsen, 2010; Williams & Roepke, 1993).

The dominant model supporting research in injury psychology was developed by Andersen and Williams (1988). Research prior to the development of this model explored the stress and injury relationship but offered little or no theoretical explanation of how stress may lead to injury (Ford, Eklund, & Gordon, 2000; Williams & Andersen, 1998; Williams & Roepke, 1993). Many subsequent inquiries have reported results in support of this model (Byrd, 1993; Kolt & Kirkby, 1996; Meyer, 1995; Perna & McDowell, 1993; Petrie, 1993a, 1993b; Thompson & Morris, 1994).

The model suggests many variables as potential mediators of athletic injury including history of stressors, personality characteristics, and coping resources. These variables interact to affect the cognitive appraisal and physiological response to a stressful situation. The central hypothesis of this model is that athletes who have high life stress, low coping resources, and personality characteristics that contribute negatively to the stress response will evaluate stressful situations more negatively than those with opposite profiles (Andersen & Williams, 1988; Williams & Andersen, 1998). Consequently, they will suffer physiological and attentional disruptions leading to increased risk for injury (See Figure 1).


**Figure 1. Williams & Andersen Stress-Injury Model.**

Holmes and Rahe contributed seminal research in this area, reporting individuals who experienced major life events in the previous year were more likely to become ill than those who had lower levels of life stress; and that 50% of football athletes who scored high in life stress measures incurred injuries that required missing at least three days of sport participation (Holmes & Rahe, 1967; Holmes, 1969). More recent research has
concluded that athletes with high life stress are two to five times as likely to be injured (Williams & Roepke, 1993).

Competitive trait anxiety is the construct most associated with injury occurrence (Junge, 2000); however, conflicting results related to its relationship to injury frequency and/or severity persist in the literature (Junge, 2000; Lavallee & Flint, 1996; McLeod & Kirkby, 1995). These differences may be a result of temporal differences in anxiety measurement, using different assessments, and/or differences in the definition of injury severity. These discrepancies warrant further attention to advance our understanding of the relationship between anxiety and injury, particularly as to what sub types of anxiety (i.e. somatic, cognitive, etc) are most related to injury onset. It is our contention that somatic anxiety may in fact be a more robust predictor of musculoskeletal injury in that it is the physical manifestation of a psychological construct, as opposed to cognitive variables which are solely manifest in the mind. Consider the example of a football athlete suffering from somatic anxiety during a stressful game. In the event that this manifests itself as muscular tension, he may be predisposed to muscle injury, for example, a hamstring strain. Cognitive constructs certainly can and do play a role in the attentional field changes supported by the Williams and Andersen model, but an argument can be made that there is likely a stronger link between somatic anxiety and musculoskeletal injury secondary to their shared involved tissues.

The third variable in the Williams and Andersen model believed to play a role in athletic injury is that of coping resources. Lack of coping skills has been shown to have a significant effect on injury predisposition and outcome; in particular, a lack of coping skills appears to play a role in the onset and/or severity of injury as they tend to exacerbate the stress response (Hanson, McCullagh, & Tonymon, 1992; Williams, Tonymon, & Wadsworth, 1986).

On the whole, data have shown that there is a relationship between life stress, competitive trait anxiety, and low coping skill and injury in athletes. Studies in this area have commonly relied on multiple regression models (e.g., Petrie, 1993a, b). However, models that are specifically designed for count outcomes, and that can account for over-dispersion of count data, produce more efficient, unbiased estimates. The purpose of this study was to determine the influence of psychosocial mediators and baseline orthopedic data on injury in college athletes using hurdle regression analysis (HRA). HRA has been reported as a superior model as compared to more commonly used Poisson regression in that HRA is more flexible in dealing with excessive counts of zero (in the present case-‘zero days missed’). When the over-dispersion is present, other models like Poisson are abandoned and HRA becomes the preferred tool (Rose, Martin, Wannemuehler, & Plikaytis, 2006).

In line with the Williams and Andersen model, our hypothesis was that competitive anxiety, life stress, and orthopedic screening score would be significant predictors of days missed due to injury. Specifically, athletes with high levels of stress, anxiety and orthopedic risk scores will incur more days missed due to injury.
METHODS

Participants

One hundred seventy seven NCAA division II college student athletes participated in this study ranging in age from 18-23 years old (M=19.45±1.39). There were 116 men, and 61 women in the sample representing American football, men’s soccer, women’s soccer, women’s volleyball, women’s tennis, and men’s and women’s cross-country. All subjects signed letters of informed consent, and the study was approved by the institutional review board.

Instruments

Competitive Trait Anxiety

The assessment of competitive trait anxiety was completed with the Sport Anxiety Scale (SAS) (Smith, Smoll, & Schutz, 1990). It is a 21 item multi-dimensional measure of competitive trait anxiety that consists of three subscales. Somatic anxiety, worry, and concentration disruption have maximum scores of 36, 28, and 20 respectively. The higher the score on each subscale (as well as total score), the higher the competitive trait anxiety. Internal consistency coefficients have been found to be 0.92, 0.86, and 0.81 for somatic anxiety, worry, and concentration disruption respectively. For the total scale, the alpha coefficient has been reported to be as high as 0.93 (Smith, et al, 1990). In terms of discriminant validity, the SAS was found to be negatively correlated to the both the Marlowe-Crowne Social Desirability Scale, and the Rosenbaum Self Control Schedule. These findings suggest that anxiety is not related to the positive presentation of one’s self socially, nor is it related to coping skills (Smith, Smoll & Schultz, 1990; Smith, Smoll, & Wiechman, 1998). In the present analysis, internal consistency was calculated to be 0.88, 0.86, and 0.74 for somatic anxiety, worry and concentration disruption respectively. The internal consistency of the entire scale was 0.87.

Life Event Stress

The assessment of life stress was completed with the Life Events Survey for College Athletes (LESCA) (Petrie, 1992). The LESCA is a 69-item survey that asks participants to report on events experienced during the previous year. Participants are asked to rate the impact of each event on an 8-point Likert type scale ranging from −4 (extremely negative) to +4 (extremely positive). A negative, positive, and total life stress score may be calculated by adding the scores within each subscale. Adding the absolute value of the positive and negative sections determines total stress. The LESCA has been found to have good content validity and to be a valid measure of life stress (Petrie, 1992).

With regards to our use of the bi-directional stress measure (i.e., positive and negative), it should be noted that Petrie (1992) reported that although the overall construct of stress is being measured, the LESCA is sensitive to both positive and negative stress, which are not specifically measured with other more general inventories like the Social and Athletic Readjustment Rating Scale (Bramwell, Masuda, Wagner, &
Holmes, 1975). We chose to use negative and positive life stress scores while not including total stress score in order to avoid multicollinearity.

**Orthopedic Screening**

We used the institutional orthopedic screening instrument to assess physical data. Subscales included: (1) injury history, (2) hamstring flexibility, (3) groin flexibility, (4) low back flexibility, (5) hip flexor/quadriceps flexibility, (6) iliotibial band flexibility, (7) gastrocnemius flexibility, and ligamentous stability at the shoulder, knee, and ankle. Scores were assigned for each section based on the following criteria: for the history section, one point was given for every orthopedic injury reported in the previous 3 years; likewise, in the joint stability section, for each joint at which a positive test was recorded, one point was added. In the flexibility sections, scores of excellent, good, average, and poor are available and only scores of poor were given one point. Points were summed on the orthopedic screening form in order to tabulate an orthopedic screening risk score for each athlete. Higher scores on this instrument indicate higher risk for injury. Inter-rater reliability of this screening tool was found to be 0.98 in pilot research conducted prior to the study in a group of certified athletic trainers. This scoring protocol has not been employed previously. We believe this to be a novel interpretation of commonly recorded orthopedic data. Instruments and procedures vary greatly across institutions for the measurement of these data, though we submit this as a pilot procedure for assessing injury risk.

**Injury recording**

Head certified athletic trainers assigned to each sport by the institution recorded injuries and days missed due to injury for each athlete. Participants were assigned one day missed for each practice or competition for which they were restricted from full activity due to injury. At the end of the season, the total number of injuries and number of days missed due to injury were calculated. Only days in which practice or competition were scheduled were counted.

**Procedure**

Fall sport athletes were asked to volunteer to participate in the study at their initial pre-season eligibility meetings. The researcher discussed the study briefly with each team and then administered research packets containing the informed consent document, demographics sheet, and psychological inventories. Those athletes who agreed to participate in the study did so by signing the informed consent, completing the questionnaires, and returning them to the researcher.

Athletes’ injury records were monitored across competitive seasons by certified athletic trainers. Hurdle regression analysis was then employed to determine the impact of psychosocial and orthopedic data on injury days missed. Data analysis was completed using the STATA Data Analysis and Statistical Software, Version 10.0 (StataCorp, College Station, Texas).
Data Analysis

We employed hurdle regression analysis to examine the influence of psychosocial and orthopedic variables on injury and injured days missed. This tool is a two-part model where “no injury” is the “hurdle” one must overcome in order to have a count of days missed due to injury. The first part of the model uses a binary logistic regression to predict the probability of being injured. For those injured, the second part of the model uses a zero-truncated negative binomial regression to predict the expected number of days missed due to injury. This component of the model is “zero-truncated” since there are no “zero days missed due to injury” in this part of the HRA. Each part of the model can have different independent predictor variables. Both parts of the HRA had the following variables in common: gender, age, worry, concentration disruption, somatic anxiety, total negative life stress, total positive life stress, orthopedic screening score, and interaction variables between worry, somatic anxiety, and concentration disruption, and total negative life stress. The zero-truncated negative binomial regression model also included number of days until first injury and total number of injuries.

RESULTS

Of the total sample, 125 athletes (70.6%) incurred injuries that resulted in at least one day missed during the season versus 52 (29.4%) who did not. Men missed an average of 11.69 ±15.65 days due to injury while women missed an average of 9.26 ±15.01 days. For the entire sample, the average number of days missed due to injury was 10.85 ±15.43. A summary of days missed by team and scores on independent variables can be found in Tables 1 and 2 respectively.

The binary logistic regression model in the first part of the HRA showed that gender (p=0.02), age (p=0.02), and total positive life stress (p=0.04) were significant predictors of whether a student athlete was injured or not (See Table 3). The zero-truncated negative binomial regression model indicated that somatic anxiety (p=0.02), total positive life stress (p<0.001), total negative life stress (p=0.01), and orthopedic screening score (p=0.01), were significant predictors of days missed due to injury. Not surprisingly, and parallel to previous work in this area (Petrie 1993 a, b) all three interactions of worry (p<0.001), somatic anxiety (p=0.04), and concentration disruption (p=0.04) with total negative life stress were significant. In other words, when individuals with high life stress also had personality characteristics that may exacerbate the stress response, injury risk was increased.

In all, older males with high positive life stress were more likely to be injured, while somatic anxiety, stress, and orthopedic risk were significant predictors of days missed due to injury. Injured athletes that had combinations of high scores in worry, somatic anxiety, concentration disruption, with life stress were at the greatest risk for days missed due to injury. HRA summary data is presented in Table 4.
Table 1. Injuries and Days Missed by Sport

<table>
<thead>
<tr>
<th>Sport</th>
<th>N</th>
<th>Percent of team injured</th>
<th>Mean days missed</th>
<th>SD</th>
<th>Percent of total injured sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>75</td>
<td>80</td>
<td>11.41</td>
<td>14.77</td>
<td>47.4</td>
</tr>
<tr>
<td>Men’s Soccer</td>
<td>30</td>
<td>80</td>
<td>13.03</td>
<td>19.60</td>
<td>19.0</td>
</tr>
<tr>
<td>Women's Soccer</td>
<td>26</td>
<td>50</td>
<td>11.58</td>
<td>20.27</td>
<td>10.5</td>
</tr>
<tr>
<td>Volleyball</td>
<td>13</td>
<td>90</td>
<td>10.62</td>
<td>9.17</td>
<td>7.3</td>
</tr>
<tr>
<td>Women’s Tennis</td>
<td>7</td>
<td>42.8</td>
<td>3.43</td>
<td>5.03</td>
<td>2.6</td>
</tr>
<tr>
<td>Cross Country</td>
<td>26</td>
<td>61.5</td>
<td>8.12</td>
<td>9.93</td>
<td>12.8</td>
</tr>
<tr>
<td>Total</td>
<td>177</td>
<td></td>
<td>10.85</td>
<td>15.43</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Criterion and Predictor Variable Means

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Males</th>
<th>SD</th>
<th>Females</th>
<th>SD</th>
<th>Injured n=127</th>
<th>Uninjured n=50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Missed</td>
<td>10.85</td>
<td>15.43</td>
<td>11.68</td>
<td>15.65</td>
<td>9.26</td>
<td>15.01</td>
<td>15.12</td>
<td>0.00</td>
</tr>
<tr>
<td>Worry</td>
<td>15.11</td>
<td>4.69</td>
<td>13.75</td>
<td>4.10</td>
<td>17.70</td>
<td>4.69</td>
<td>15.03</td>
<td>15.32</td>
</tr>
<tr>
<td>CD</td>
<td>7.22</td>
<td>2.16</td>
<td>6.66</td>
<td>1.95</td>
<td>8.31</td>
<td>2.16</td>
<td>7.16</td>
<td>7.40</td>
</tr>
<tr>
<td>SA</td>
<td>16.72</td>
<td>5.07</td>
<td>16.82</td>
<td>4.83</td>
<td>16.54</td>
<td>5.54</td>
<td>17.37</td>
<td>15.10</td>
</tr>
<tr>
<td>NLES</td>
<td>13.90</td>
<td>12.29</td>
<td>11.85</td>
<td>10.56</td>
<td>17.82</td>
<td>14.35</td>
<td>14.90</td>
<td>11.38</td>
</tr>
<tr>
<td>PLES</td>
<td>11.97</td>
<td>10.78</td>
<td>11.28</td>
<td>9.83</td>
<td>13.29</td>
<td>12.40</td>
<td>12.76</td>
<td>10.00</td>
</tr>
<tr>
<td>Ortho</td>
<td>3.83</td>
<td>2.58</td>
<td>4.15</td>
<td>2.47</td>
<td>3.23</td>
<td>2.72</td>
<td>4.10</td>
<td>3.14</td>
</tr>
</tbody>
</table>

CD= Concentration Disruption
NLES=Negative Life Event Stress
SA= Somatic Anxiety
PLES= Positive Life Event Stress
Ortho= Orthopedic Screen Score

Table 3. Binary logistic model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds Ratio</th>
<th>S.E.</th>
<th>p value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.364</td>
<td>0.166</td>
<td>0.027</td>
<td>0.149</td>
</tr>
<tr>
<td>Age</td>
<td>0.684</td>
<td>0.117</td>
<td>0.027</td>
<td>0.489</td>
</tr>
<tr>
<td>Worry</td>
<td>1.053</td>
<td>0.098</td>
<td>0.576</td>
<td>0.877</td>
</tr>
<tr>
<td>CD</td>
<td>1.226</td>
<td>0.199</td>
<td>0.209</td>
<td>0.891</td>
</tr>
<tr>
<td>SA</td>
<td>0.956</td>
<td>0.082</td>
<td>0.601</td>
<td>0.808</td>
</tr>
<tr>
<td>NLES</td>
<td>1.260</td>
<td>0.159</td>
<td>0.069</td>
<td>0.982</td>
</tr>
<tr>
<td>PLES</td>
<td>0.959</td>
<td>0.019</td>
<td>0.047</td>
<td>0.921</td>
</tr>
<tr>
<td>Ortho</td>
<td>0.899</td>
<td>0.071</td>
<td>0.184</td>
<td>0.769</td>
</tr>
<tr>
<td>Worry*NLES</td>
<td>0.997</td>
<td>0.006</td>
<td>0.697</td>
<td>0.984</td>
</tr>
<tr>
<td>SA*NLES</td>
<td>0.995</td>
<td>0.005</td>
<td>0.411</td>
<td>0.983</td>
</tr>
<tr>
<td>CD*NLES</td>
<td>0.982</td>
<td>0.011</td>
<td>0.118</td>
<td>0.960</td>
</tr>
</tbody>
</table>

NLES=Negative Life Event Stress
SA= Somatic Anxiety
PLES= Positive Life Event Stress
CD= Concentration Disruption
Ortho= Orthopedic Screen Score
Table 4. Zero truncated negative binomial model

<table>
<thead>
<tr>
<th>Variables</th>
<th>IRR</th>
<th>S.E.</th>
<th>p value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days_inj</td>
<td>0.991</td>
<td>0.003</td>
<td>0.011</td>
<td>0.984</td>
</tr>
<tr>
<td>Gender</td>
<td>1.007</td>
<td>0.140</td>
<td>0.958</td>
<td>0.767</td>
</tr>
<tr>
<td>Age</td>
<td>0.977</td>
<td>0.034</td>
<td>0.524</td>
<td>0.911</td>
</tr>
<tr>
<td>Worry</td>
<td>0.968</td>
<td>0.016</td>
<td>0.052</td>
<td>0.937</td>
</tr>
<tr>
<td>CD</td>
<td>0.992</td>
<td>0.076</td>
<td>0.927</td>
<td>0.853</td>
</tr>
<tr>
<td>SA</td>
<td>1.080</td>
<td>0.037</td>
<td>0.029</td>
<td>1.008</td>
</tr>
<tr>
<td>NLES</td>
<td>1.105</td>
<td>0.043</td>
<td>0.010</td>
<td>1.023</td>
</tr>
<tr>
<td>PLES</td>
<td>0.987</td>
<td>0.002</td>
<td>0.000</td>
<td>0.982</td>
</tr>
<tr>
<td>Ortho</td>
<td>1.064</td>
<td>0.026</td>
<td>0.012</td>
<td>1.014</td>
</tr>
<tr>
<td>Worry*NLES</td>
<td>1.002</td>
<td>0.001</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>SA*NLES</td>
<td>0.996</td>
<td>0.001</td>
<td>0.043</td>
<td>0.993</td>
</tr>
<tr>
<td>CD*NLES</td>
<td>0.993</td>
<td>0.003</td>
<td>0.040</td>
<td>0.987</td>
</tr>
</tbody>
</table>

NLES=Negative Life Event Stress  
PLES= Positive Life Event Stress  
Ortho= Orthopedic Screen Score  
SA= Somatic Anxiety  
CD= Concentration Disruption  
Days_inj= Days to first injury

(Std. Error adjusted for 6 clusters in sport)

**DISCUSSION**

The results supported our hypothesis. High life stress, somatic anxiety, and orthopedic risk score were significant predictors of days missed due to injury. These results parallel the central hypothesis of the Williams and Andersen stress and injury model (Williams & Andersen, 1998). Our results were similar to other reports in which 90% of the research found a significant relationship between life stress and injury in diverse, multisport samples similar to our own (Williams & Roepke, 1993).

Several studies have reported life stress (Petrie, 1992, 1993a, b) and anxiety (Williams & Roepke, 1993; Petrie, 1993a; Junge, 2000) as significant predictors of athletic injury and time lost due to injury. Overall, our study concurred with past research. However, we would contend that our use of hurdle regression analysis significantly strengthens the literature in this area. Specifically, data that follow a negative binomial distribution instead of a Poisson distribution will tend to be “overdispersed.” That is, the variance of the data will be much greater than the mean, whereas in a Poisson distribution the mean and variance are equal. With regards to past reports (Petrie, 1992; Petrie, 1993a, b), it is unclear whether over-dispersion of injury data due to participants who incurred zero days missed or zero injuries was taken into account. We specifically addressed this issue with the use of HRA. The likelihood-ratio test for over-dispersion showed that there was significant over-dispersion in the data (p < 0.001), thus a negative binomial regression model for the second part of the HRA is clearly preferred over a Poisson or other regression model. We believe that the results from the more robust HRA model add significant support to the credence of these previous findings in support of the Williams & Andersen model.

Somatic anxiety was significant in its ability to predict days missed due to injury similar to other research (Junge, 2000; Petrie, 1993a). However, many of these studies
used instruments that were unidimensional in nature; and thus, authors were less able to comment on the effects of specific subcategories of trait anxiety (e.g. worry, concentration disruption & somatic anxiety) as we were in our study. Our study improved upon these measures by using the multidimensional Sport Anxiety Scale as recommended by Williams and Andersen (1998) and did, in fact, elucidate somatic anxiety as a significant predictor of days missed. Not surprisingly, the significant interactions of worry (p<0.001), concentration disruption (p=0.04), and somatic anxiety (p=0.04) with negative life stress suggest that high levels of trait anxiety mediate the impact of, and response to, negative life stress.

Regarding the second part of our hypothesis, our data supported the notion that orthopedic screening scores would show similar ability to psychosocial variables in predicting days missed due to injury. This is an interesting and potentially clinically relevant finding in the arena of athletic healthcare. It is common procedure to perform orthopedic screenings in addition to medical physicals for all athletes prior to season. This is done in order to identify those athletes who, due to physical or physiological anomaly are at increased risk for injury, however we appear to be among the first to propose a basic scoring rubric to define the level of risk. We only assigned risk for scores that were “poor” in the flexibility categories. Future studies should examine similar scoring protocols for psychometric validity while taking into account all categories (i.e., “excellent”, “good”, “fair” etc). Subsequent to this screening, those who are at increased risk can then be monitored and/or prescribed preventative maintenance exercise or treatment in hopes of preventing further injury. We hope that the addition of psychosocial screenings are considered in concert with the ubiquitous orthopedic screen in the future, as we have clearly shown that they contribute to injury onset and time loss.

Limitations of this study include the social desirability of self report, and generalizability of the data in a relatively homogenous sample. One must also consider the issue of trait versus state anxiety measures; when predicting injury, it may be prudent to consider the use of state measures of anxiety in future stress-injury research. State measures are more fluid across time and thus may be better indicators of pre-injury momentary psycho-social status than those trait measures identified prior to participation. Clearly, the recording of these in situ levels of anxiety, stress etc would be logistically challenging, though if captured, may reveal new and more robust indicators of injury risk from psychological constructs.

CONCLUSIONS

A growing body of research has supported the suggestions of the Williams and Andersen (1998) model that psychosocial mediators can and do affect injury in athletes (Byrd, 1993; Kolt & Kirkby, 1996; Meyer, 1995; Perna & McDowell, 1993; Petrie, 1992; Petrie, 1993a, 1993b; Thompson & Morris, 1994). Our study concurred with these findings in that we found significant relationships between life stress and somatic anxiety and days missed due to injury. We feel that the use of the hurdle regression strengthens this body
of research considerably and look forward to future employment of similar models in this area.

Practically, we feel these results substantiate the need for additional psychosocial screening tools in athletic healthcare. In order to fulfill the injury prevention domain of athletic training, we must not focus solely on physical measures in our preventative efforts. We must holistically consider all etiological factors in order to identify those at risk and subsequently intervene preventatively. For example, future studies may examine the efficacy of performance enhancement programs or stress management interventions in athletes that have been identified as “at risk” in pre season psychosocial evaluations, much like the common practice of prescribing preventative strengthening or flexibility for at risk anatomic structures.

However, this raises questions as to the ethical and practical role of the certified athletic trainer in the administration and interpretation of psychological measures. Currently, entry level certified athletic trainers are commonly only required to take one general psychology class as per accreditation guidelines, yet are often called upon to provide psychological support to athletes (Stiller-Ostrowski, Gould, & Covassin, 2009). If athletic trainers are asked to identify those at risk for injury and prevent it, and psychological factors may predispose one to injury, are we asking too much of athletic trainers in the psychological arena that may result in putting athletes at risk? More training for certified athletic trainers may be necessary for the adequate and safe treatment of athletes in the psychological domain. Although not within the scope of this paper, this point leads one to conclude that the presence of trained sport psychology staff becomes more important with increases in knowledge and data regarding injury psychology.

Future research in athletic training may include exploration of the validity and reliability of our novel scoring technique for orthopedic data, as well as the use of preventative psychosocial interventions with relation to injury onset and severity, and other multidimensional studies that include both physical as well as psychological markers in injury prediction and prevention using rigorous statistical modeling.

REFERENCES


THE EFFECTS OF DIRECTING THE LEARNER’S GAZE ON SKILL ACQUISITION IN GYMNASTICS

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1 German Sport University Cologne, Cologne, Germany
2 International Gymnastics Federation, Lausanne, Switzerland

ABSTRACT

Although eye movements and motor acts are strongly connected when performing complex skills, little is known about when perceptual instructions facilitate the acquisition of skills in gymnastics. The goal of this experiment was to evaluate the effects of perceptual instructions on performance in the acquisition and retention of a handspring on vault in gymnastics. It was predicted that participants who are provided with either perceptual instructions or perceptual instructions and external visual cues would improve their performance to a greater extent than participants of a control group. Movement quality and movement kinematics of 30 gymnasts in the acquisition and retention of the handspring on vault in gymnastics were analyzed. Movement quality was higher for both experimental groups (instructions and instructions + visual cues) compared to the control group in a retention-test. Furthermore, participants of the two experimental groups exhibited a higher horizontal velocity during run-up as well as a higher and longer second flight phase. Findings suggest that perceptual instructions facilitate learning of the handspring on vault in gymnastics, whereas no remarkable difference was found between gaze behavior being instructed or instructed and triggered by external visual cues.

Keywords: handspring on vault, kinematic analysis, performance rating.

In most sport tasks the first visible action is usually an eye movement to the location of some important feature in the environment (Land & Furneaux, 1997). Having found the needed feature, the eyes fixate on it for a fraction of a second whilst the visual system extracts the information needed during the performance of the task. Thereafter, the eyes move on to the next information-rich area in a given situation. This sequence generates a complex eye movement pattern that is interconnected with the motor action. Following the argumentation of Land and Furneaux (1997) it is assumed that a schema or set of instructions develops during motor skill acquisition which directs both eye and body movements. Thus, a specific eye movement strategy is associated with a specific motor skill. This strategy is highly task-specific and dependent on the performer’s skill level (Williams, Singer, & Frehlich, 2002).

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From this point of view, the following question arises: Is it possible to facilitate the acquisition and retention of motor skills by teaching learners to use the same eye movement strategies that skilled athletes use? A positive answer to this question would provide coaches and teachers with advice about how to design practice and intervention strategies more effectively. Therefore, the goal of this experiment was to evaluate the effects of perceptual instructions on performance in the acquisition and retention of a complex movement, namely the handspring on vault in gymnastics.

It has been repeatedly shown that experts use task-specific visual feedback in complex movements, even if these movements are highly dynamic as, for example, somersaults in gymnastics (Rézette & Amblard, 1985). Davlin, Sands, and Shultz (2004) provided evidence for the so-called spotting-hypothesis, which is a strategy in which gymnasts intentionally decrease head velocity to fixate their gaze in the landing preparation after a somersault. More recently, Luis and Tremblay (2008) had experienced acrobats perform back tucked somersaults under four experimental conditions: (1) full-vision, (2) vision at angular head velocities below 350 degrees per second, (3) vision at angular head velocities above 350 degrees per second, and (4) no-vision. The angular velocity of the head was measured in real time, triggering liquid crystal goggles in order to manipulate vision. The authors could show that all the vision conditions resulted in better performances than the no-vision condition, and that the vision condition with angular head velocities below 350 degrees per second resulted in better landing performances than the full-vision condition. The authors concluded that optimal visual feedback use occurs when there is retinal stability during the somersault.

Further support for the spotting-hypothesis comes from a recent study of Raab, de Oliveira, and Heinen (2009). The authors had expert- and novice-gymnasts perform somersaults on the trampoline and measured their gaze behavior by using a novel eye-tracking system. Furthermore, parameters of the gymnasts’ movement kinematics, such as movement duration, moment of inertia, and angular momentum, were measured. The experts’ gaze behavior was directly related to movement duration, moment of inertia, and angular momentum of the somersaults. The authors argued that experts use visual fixations in order to pick up information about their rotation and can make in-flight adjustments to assure an adequate landing with this information (see also Bradshaw, 2004).

Other research has demonstrated the benefits of training visual search in different tasks (Czerwinski, Lightfoot, & Shiffrin, 1992), and there is evidence to support the value of perceptual instructions for facilitating skill acquisition in gross motor skills (Abernethy, Wood, & Parks, 1999; Adolphe, Vickers, & LaPlante, 1997; Williams, Ward, & Chapman, 2003; Williams, Ward, Knowles, & Smeeton, 2002).

Williams, Ward, Smeeton, and Allen (2004) had novice tennis players, divided into three groups, practice the anticipation of an opponents’ serve in tennis. The first group (perception-action) received formal instructions on the biomechanics of the tennis serve and the key information cues underlying anticipation skill. Participants were also given the opportunity to practice returning an opponent’s serve. Participants in the second group (perception-only) received the same information as the perception-action group, but their physical practice was restricted. Participants in the third group (technical
instructions) were given technical instructions, but no instructions on visual cues during practice. Participants of the perception-action and the perception-only group significantly reduced their response initiation time, but not their response accuracy when returning tennis serves. Participants of the control group enhanced neither of the two parameters. The authors concluded that perceptual instructions can enhance performance, but either of the two modes of training (perception-action or perception-only) could be effective.

The authors further acknowledged, that the effect of perceptual instructions strongly depends on the nature of the task. For instance, reading an opponent’s intention in tennis is likely to rely on a different form of visual information processing (e.g., ventral stream, Milner & Goodale, 1995) than performing a complex gymnastics skill. Moving towards a vaulting table with the intention to perform a handspring could rely more on dorsal stream information, because perceptual variables (e.g., time-to-contact information) need to be mapped concurrently onto movement parameters (e.g., velocity of the run-up). The authors state, that “perceptual training should be specific to the functional demands placed upon the visual system in the performance context” (Williams et al., 2004, p. 358) in order to enhance the acquisition and retention of a motor skill. However, little is known about these effects in the learning process of complex skills in gymnastics.

Assuming that perceptual instructions also facilitate skill acquisition in gymnastics, two different strategies that incorporate the directing of visual information pickup in gymnastics can be distinguished. The first and simplest way is to direct the learner’s gaze by gaze behavior instructions, which are integrated in methodical progressions (Land & Furneaux, 1997). The second way is to direct the learner’s gaze by external cues, for instance, visual spots placed in distinct, information-rich areas in the environment. Both strategies are applicable for coaches in gymnastics (Arkaev & Suchilin, 2004).

In this current field experiment, novice gymnasts were examined in order to see whether they could be trained to acquire the skill of a handspring on vault more effectively by using different forms of perceptual instructions during the acquisition of the skill. One group received specific instructions on gaze behavior (instruction group) and another group received additional external visual cues on where to direct their gaze (instruction + visual cues group). A third group of participants that received only standard methodical training and no additional information on gaze behaviour was included as a control group. Basic gymnastics ability was assessed in a pre-test in order to match the participants to the three groups.

It was hypothesized that the two experimental groups would improve their performance to a greater extent than the control group, and that the persistence of learning would be higher for both experimental groups. Furthermore, it was hypothesized that the instruction + visual cues group would demonstrate a remarkable improvement in performance compared to the instruction group.

It was decided to analyze handspring on vault performance in terms of judged performance quality and movement kinematics in a post- and retention-test. This was done because research shows that the estimation of movement quality by observation may capture different aspects of movement performance than the analysis of kinematic parameters and vice versa (e.g., Prassas, Kwon & Sands, 2006; Takei, 1989, 1990). These aspects are formalized in terms of execution and artistry of presentation in gymnastics’
judging guidelines (FIG, 2009). Therefore both entities were analyzed to detect where the hypothesized effects occur.

**METHOD**

**Participants**

Thirty Sport Science students (male, $n = 10$, $M_{\text{age}} = 22$, $SD = 2$ years; female, $n = 20$, $M_{\text{age}} = 22$, $SD = 3$ years) volunteered to participate in this study. The number of participants was derived from a power analysis, when expecting a medium effect (Cohen’s $f > 0.25$), with the probability of a type I error of 5%, and of a type II error of 20%. All of the students had basic gymnastic experience due to their successful participation in a level 1 gymnastics course at the German Sport University Cologne. The students were asked to participate in an experiment on learning a gymnastic skill. They were informed about the procedure of the study and gave their written consent prior to the experiment, which was carried out in accordance with the ethical guidelines and the approval of the German Sport University Cologne. After the experiment, they were debriefed and received a small token of appreciation for their participation.

The participants were assigned to one of three experimental groups on the basis of a gymnastics coordination test (GCT). This procedure ensured that the three groups had equivalent coordinative skill levels at the beginning of the learning experiment. All three groups were meant to learn the criterion movement, while two of the groups received specific instructions on gaze behavior when performing the handspring on vault. Of these two groups, one group was provided with additional visual cues (instruction + visual cues group) and the other group without additional visual cues (instruction group) attached to distinct environmental areas. The participants of the third group received no gaze behavior instructions or cues (control group). All three groups received standardized technical instructions and feedback. Manual guidance was provided during the first four trials of each step in the methodical progression of the handspring on vault. All 30 participants completed the experiment and acquired the criterion movement. There were no injuries during the experiment.

Another sample of 50 ($n = 25$ male and $n = 25$ female) gymnasts was recruited in order to analyze the reliability of the Gymnastics Coordination Test. The gymnasts had an average age of $22 \pm 4$ years, and an average gymnastics experience of $5 \pm 3$ years. An additional sample of $n = 3$ expert gymnasts were analyzed on their gaze behavior and movement kinematics when performing the criterion movement. They had an average age of $22 \pm 1$ years and an average gymnastics experience of $10 \pm 2$ years with regular practice and participation in regional championships.
Tasks and Materials

Gymnastics Coordination Test
The Gymnastics Coordination Test (GCT) is a frequently used instrument in gymnastics training camps in Germany to systematically screen young gymnasts (DTB, 2007). The GCT consists of 11 gymnastic-specific tasks, such as performing a 15-m sprint or holding a straddle support. Depending on the task, measures of time or amplitude are assessed and three distinct scores together with one summed score can be calculated on the basis of the performance in the 11 tasks. Norms are available for 7 to 18 year old male and female gymnasts. The reliability of the GCT was analyzed in a test-retest design. The results indicate significant product-moment correlations for a sample of 50 gymnasts between the three test scores over the 1-week testing period. The correlation coefficients ranged from $r = .78$ to $r = .94$ ($p < .05$).

In this experiment, the GCT was used to assign the participants to either one of the two experimental groups or the control group as matched samples. After calculating the summed score of each participant, they were ranked with regard to their overall performance as indicated by the summed score of the GCT. Participant triplets were formed from the ranking, with the three participants having equal or close to equal scores in the GCT. Of each triplet, the participants were randomly assigned to either one of the two experimental groups or the control group.

Experimental Task and Methodical Progression
The experimental task (criterion movement) was a handspring on vault (see Figure 1). The movement can be subdivided into six phases: 1. run-up, 2. take-off, 3. first flight phase, 4. repulsion phase, 5. second flight phase, and 6. landing phase (Brüggemann, 1994). The aim of the run-up is to achieve a sufficient level of kinetic energy, which is then used and transferred in the subsequent phases (Prassas et al., 2006). During the take-off phase, the kinetic energy from the run-up is transferred into a whole body rotation about the transverse axis. Furthermore, the gymnast has to generate an optimal centre of mass velocity prior to the first flight phase. The aim of the first flight phase is to reach an optimal support in order to prepare the repulsion phase. In the repulsion phase, the horizontal and vertical velocities are altered and the angular momentum is reduced (Arkaev & Suchilin, 2004). The goal of the second flight phase is to achieve optimal height and sufficient rotation in order to land in an upright position. The kinetic energy is dissipated during the landing (Takei, 1998).

The methodical progression for the criterion movement was derived from standard progressions in the gymnastics coaching literature (Arkaev & Suchilin, 2004), and the basic courses of the German Sport University Cologne. Because there were novice gymnasts in this study, a miniature trampoline was used as a take-off surface, thus guaranteeing that all participants could learn the handspring in the limited time period of the experiment. The methodical progression consisted of six distinct tasks combined with task-specific lead up activities (Arkaev & Suchilin, 2004; Mitchell, Davis & Lopez, 2002). Lead-up activities included, for example, the handstand, drop-jumps from short run-ups, and landings after straight jumps.
Perceptual Instructions
Perceptual instructions were derived from a pilot study, measuring the gaze behavior of three expert gymnasts with a wireless eye tracking device in combination with a movement analysis system (cf., Raab, de Oliveira, & Heinen, 2009). The experts were asked to perform \( n = 5 \) handsprings on vault in the condition that was used to assess participant’s post-test and retention-test performance. The expert’s type of gaze as well as the corresponding locations and objects in the visuo-motor workspace were coded by utilizing Vickers’s (2007) vision-in-action paradigm. This was done with regard to each of the six movement phases of the handspring on vault. Statistical analysis showed high consistency in the structure of the gaze behavior among the three experts (Fleiss’ kappa = .89). In particular, the experts fixated the areas shown in Table 1 and Figure 1 most frequently during the six movement phases.

The perceptual instructions were constructed in the following form: “Try to fixate your gaze to A during B”. \( A \) was substituted by the gaze behavior area of interest (cf. Table 1 and Figure 1), and \( B \) was substituted by the corresponding movement phase. For instance, the instruction for the run-up phase was: “Try to fixate your gaze to the middle of the trampoline bed during the run-up.” All six instructions on gaze behavior were given in a standardized and quasi-randomized manner, always providing two instructions per trial and not giving the same instruction more than twice in a row.

Table 1. Movement phases, gaze behavior areas of interest of \( n = 3 \) expert gymnasts, as well as kinematic parameters that discriminate between “better” and “worse” handspring on vault performances with regard to the judging guidelines of the German Gymnastics Federation (DTB, 2001; CM = centre of mass). The numbers correspond with the arrows in Figure 1

<table>
<thead>
<tr>
<th>Movement phase</th>
<th>Area of Interest</th>
<th>No.</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-Up</td>
<td>Middle of Trampoline Bed</td>
<td>1</td>
<td>Higher Horizontal CM Velocity</td>
</tr>
<tr>
<td>Take-Off</td>
<td>Front Side of Vaulting Table</td>
<td>2</td>
<td>Higher Horizontal CM Velocity</td>
</tr>
<tr>
<td>First Flight Phase</td>
<td>Top Side of Vaulting Table</td>
<td>3</td>
<td>Higher Angular Momentum Support Angle Close to 30° Shorter Phase Duration</td>
</tr>
<tr>
<td>Repulsion Phase</td>
<td>Top Side of Vaulting Table /Hands</td>
<td>3</td>
<td>Shorter Phase Duration Take-off Angle Close to 90° Bigger Moment of Inertia at Take-Off Larger Horizontal CM Velocity at Take-Off</td>
</tr>
<tr>
<td>Second Flight Phase</td>
<td>Distant Wall in Front of the Athlete</td>
<td>4</td>
<td>Longer Phase Duration</td>
</tr>
<tr>
<td>Landing</td>
<td>End of Landing Mat, Diagonally Downwards in Front of the Athlete</td>
<td>5</td>
<td>Larger Moment of Inertia at Touch-Down</td>
</tr>
</tbody>
</table>
The Effects of Directing the Learner’s Gaze on Skill Acquisition in Gymnastics

Performance Rating
The performance measure was based on the participant’s performance at the end of the methodical progression. This was when the participants performed the handspring on vault in the post-test together with the performance of the handspring on vault in a retention-test two weeks later. The performances were videotaped by a digital video camera operating at 50Hz. The camera was placed 15m away from and orthogonal to the vaulting table. Three trials of post- and retention-test performances of each participant were videotaped and rated by three independent national-level gymnastics coaches. The coaches scored the quality of each performance attempt on a 5-point Likert type scale. The performance attempts were presented in two distinct blocks (referring to the post- and the retention-test) and in a randomized fashion in order to ensure that the coaches remained blind to the treatment conditions. Inter-observer reliability was calculated at $r_{ICC} = .85$ ($p < .05$) using the coefficient of intra-class correlation over all trials. The scores for each trial were averaged in order to give a final performance score.

Kinematic Analysis
The videotaped performances were used for further kinematic analysis. The horizontal and vertical coordinates of 8 points (body landmarks) defining a 7-segment model of the human body were recorded for each frame using the movement analysis software $utilius$ easyINSPECT (CCC-Software, 2008). This model outline was chosen due to its wide use in similar research (King & Yeadon, 2004). Because a single handspring on vault only contains regulatory low frequency movements, a frame rate of 50Hz was seen as sufficient for kinematic analysis of the handspring on vault by an independent biomechanist. A digital filter (cut off frequency = 6 Hz) for data smoothing was applied and a mean temporal error of ± .02 seconds, and a mean spatial error of ± .006 meters were calculated from the data. Body-segment parameters were calculated on the basis of the individual anthropometric properties of each participant.

In order to evaluate the reliability of the 7-segment model, the vertical acceleration of the first author’s center of mass in the flight phase of a somersault was calculated. This performance was also recorded by the same camera setup mentioned above. Because the
vertical acceleration should represent the gravitational acceleration, it is seen as a reliable indicator for evaluating kinematic data (Enoka, 2002). The calculated value was \( g = -(9.807 \pm 0.005) \text{ m/s}^2 \) for vertical acceleration, which was not significantly different to the conventional standard value of \( g = -9.81 \text{ m/s}^2 \), \( t(5) = -0.6, p = .42 \).

Time-discrete kinematic parameters for the handspring on vault were calculated. With the help of a biomechanist and a top-level gymnastics coach, we chose 10 kinematic parameters from our movement analysis data that represent the most relevant judgment criteria from a biomechanical point of view (DTB, 2001, cf. Table 1) and make it possible to differentiate between “better” and “worse” handspring performances. Gymnasts who perform better handsprings on vault show differences in the run-up, first flight phase, repulsion phase, second flight phase, and landing phase. One can say that during the run-up, a higher initial velocity characterizes better handsprings on vault because the initial velocity determines the kinetic energy of the athlete. The first flight phase is characterized by a higher amount of angular momentum, a shorter duration, and a support angle on the table of about 30 degrees. The repulsion phase is characterized by a shorter contact time on the vaulting table, a take-off angle close to 90 degrees, a larger moment of inertia about the somersault axis at take-off, and a higher horizontal velocity at take-off. The second flight phase is characterized by a longer duration, which is determined by the vertical component of the velocity at the end of the repulsion phase. Gymnasts who perform better in general show a larger moment of inertia about the transverse axis during landing (Brüggemann, 1994).

**Procedure**

The experiment was conducted in three phases. In the first phase, the participants arrived at the gym and completed the informed consent form and the GCT. When all participants had been tested, they were assigned as matched samples to either one of the two experimental groups or the control group.

The second phase was the training period, which consisted of 6 sessions of 35 to 40 minutes per session. It was carried out over a 3-week period, with two training sessions per week. Each individual session began with a 10-minute warm-up phase, including physical preparation exercises and lead-up activities. Physical preparation included exercises such as running, stretching, and muscular preparation (Arkaev & Suchilin, 2004). Lead-up activities were, for example, the handstand, drop-jumps from short run-ups, and landings after straight jumps. Then, a learning phase of 15 to 20 minutes was conducted, and the training session ended with a 5 to 10 minute cool-down period. Each step of the methodical progression was presented in one training session. During each training session, the participants were allowed 15 practice trials. Whilst the control group only obtained verbal feedback, the two experimental groups received specific instructions on gaze behavior before performing the practice trials. The first experimental group (instruction group) received perceptual instructions only and the second experimental group (instruction + visual cues group) received additional visual cues that could be seen as red dots (15cm diameter) attached to distinct environmental areas (see Table 1 and
The Effects of Directing the Learner’s Gaze on Skill Acquisition in Gymnastics

Figure 1). Verbal feedback was provided on the movement quality of the attempt and was standardized for all three groups.

The third phase was the test-period, which consisted of a post-test and a retention-test. The post-test was carried out one day after the end of the training phase. Participants had to perform the criterion movement eight times, and the last three attempts were videotaped for later analysis. The retention-test was conducted two weeks after the post-test, and participants were asked to perform another eight handsprings on vault. As in the post-test, the last three attempts were videotaped for further analysis.

**Data Analysis**

A significance criterion of $p < .05$ was established for all results reported. Prior to testing the main hypothesis, moderating effects of age and gender were assessed using multivariate methods. There were no statistically significant moderating influences of age or gender on the dependent variables. In order to assess differences in performance rating, a $3 \times 2$ ANOVA with repeated measures on the second factor was calculated. Furthermore, separate $3 \times 2$ ANOVAs with repeated measures were calculated in order to assess differences in movement kinematics. The kinematic parameters presented in Table 1 were taken as dependent variables. Through the calculation of Holm’s correction, the inflation of Type I and Type II errors was controlled (Lundbrook, 1998). Post-hoc analyses were carried out using the Tukey’s HSD post-hoc test because of its greater power and control for Type II error inflation compared to other post-hoc tests. Cohen’s $f$ was calculated as an effect size for all ANOVAs with $F$-values higher than 1. A post-hoc power analysis was conducted on all reported results of $F$-tests. In an additional step, a correlation and regression analysis was conducted in order to explore which kinematic parameters predicted the estimated movement quality in terms of judged performance (cf., Takei, 1989).

**RESULTS**

**Performance Rating**

It was hypothesized that perceptual instructions in general would have a positive effect on performance in the acquisition and retention of the handspring on vault, whereas perceptual instructions with external visual cues should be more effective than perceptual instructions without visual cues.

A $3 \times 2$ ANOVA with repeated measures on the second factor was calculated, taking the performance rating scores as the dependent variable. The results show a significant interaction effect of Experimental Group $\times$ Test, $F(2, 27) = 3.56, p < .05$, Cohen’s $f = .51$, power = .97. Neither a significant main effect of Experimental Group, $F(2, 27) = 2.13, p = .14$, Cohen’s $f = .39$, power = .81, nor of Test, $F(1, 27) = 0.93, p = .34$, power = .84, were found. A significant difference between both experimental groups and the control group was found for the retention-test, according to
Tukey’s HSD post-hoc analysis. This was found together with a significant difference between the post-test and the retention-test for the control group. Figure 2 presents the mean performance rating scores for the two experimental groups and the control group. The participants, who were provided with perceptual instructions and visual cues, or with perceptual instructions only, maintained their performance level, whereas the participants in the control group showed a decline in performance from the post- to the retention-test.

![Figure 2. Means and standard errors of performance ratings of the two experimental groups (instructions, instructions + visual cues) and the control group for the handspring on vault in the post- and retention-test.](image)

Higher bars indicate higher movement quality (* = significant difference at \( p < .05 \) according to Tukey’s HSD post-hoc analysis).

**Movement Kinematics**

It was predicted that perceptual instructions would have a positive effect on movement kinematic performance in the acquisition and retention of the handspring on vault, whereas perceptual instructions with visual cues should be more effective than perceptual instructions without visual cues.

Separate 3 (Experimental Group) \( \times \) 2 (Test) ANOVAs with repeated measures were calculated on the kinematic parameters presented in Table 1. No interaction effects of Experimental Group \( \times \) Test or main effects of Test were found for any of the analyzed kinematic parameters. However, main effects of Group were found for the horizontal velocity during run-up, \( F(2, 27) = 6.67, \ p < .05 \), Cohen’s \( f = 0.70 \), power = .80, the horizontal velocity at the end of the repulsion phase, \( F(2, 27) = 4.62, \ p < .05 \), Cohen’s \( f = 0.58 \), power = .79, and the flight duration of the second flight phase, \( F(2, 27) = 4.21, \ p < .05 \), Cohen’s \( f = 0.55 \), power = .77. Concerning the horizontal run-up velocity and the flight duration of the second flight phase, the instruction group showed higher values than the control group. Concerning the horizontal velocity at the end of the repulsion phase,
both the instruction and the instruction + visual cues groups showed higher values than the control group (see Table 2).

**Relationships between Performance Rating Scores and Movement Kinematics**

A correlation and regression analysis was conducted in order to explore which kinematic parameters predicted the estimated movement quality in terms of judged performance (cf., Takei, 1989). It could be shown that the support angle at the end of the first flight phase, the duration of the first flight phase, the horizontal velocity of the centre of mass at the end of the repulsion phase, and the duration of the second flight phase were positively correlated with the performance rating scores (Table 2). The duration of the repulsion phase was negatively correlated with the performance rating scores. Handspring on vault performances were rated higher for participants who exhibited a longer first flight phase, a support angle closer to 30 degrees, a shorter repulsion phase, a higher horizontal take-off velocity (repulsion phase), and a longer second flight phase. A stepwise multiple regression analysis indicated, that only the support angle of the first flight phase ($\beta = .38, p = .003$) and the duration of the second flight phase ($\beta = .40, p = .03$) were significant predictors of judge’s scores. The predictors accounted for an explained variance of 41% (adjusted $R^2$).

**DISCUSSION**

The aim of this study was to evaluate the effects of perceptual instructions on performance in the acquisition and retention of a complex movement, namely the handspring on vault in gymnastics. Participants learned to perform a handspring on vault while one group of participants received specific instructions on gaze behavior and another group received specific instructions on gaze behavior together with additional external visual cues as to where to direct their gaze. Participants that only received standard methodical training were included as a control group. Perceptual instructions were derived from a pilot study measuring the gaze behavior of three expert gymnasts when performing the handspring on vault. It was predicted that the two experimental groups would improve their performance to a greater degree than the control group and that the degree of learning persistence would be higher for both experimental groups. Further, it was hypothesized that the participants who were provided with additional external visual cues would demonstrate a remarkable improvement in performance compared to the instructions only group.

The participants who were provided with visual instructions and external cues or with visual instructions only maintained their performance level in terms of judged movement quality. The participants in the control group showed in turn a decline in performance from the post- to the retention-test. Horizontal velocity during run-up and horizontal velocity at the end of the repulsion phase were higher for the instruction group compared
with the control group in the post- and the retention-test. The duration of the second flight phase was higher for both the instruction and the instruction + visual cues groups compared to the control group. With regard to the results of this experiment, it is concluded that it is possible to facilitate the acquisition of a complex motor skill by teaching learners to use an eye movement strategy that skilled athletes use. This result is in line with the assumption that a specific eye movement strategy is associated with a specific motor skill (Land & Furneaux, 1997), and that this strategy is developed through practice.

One specific eye movement strategy that learners could use is visual spotting of distinct areas in the environment (Davlin et al., 2004). Perceptual instructions triggering visual spotting seem to be beneficial for the learning process when the instructions are specific to the functional demands, placed upon the visual system, and within the performance context (cf., Abernethy et al., 1999; Williams et al., 2004). The instructions can furthermore be used to highlight or focus participant’s attention on relevant visual cues (Knudson & Kluka, 1997), or to shift participant’s attention to an external mode, which in turn may help to optimize current skill performance (Wulf, Lewthwaite, Landers & Töllner, 2009).

When performing the handspring on vault, the gymnast has to estimate the distances to the take-off surface or the support surface whilst running towards the apparatus in order to place his or her feet and hands in the right place at the right time. A time-to-contact estimation may provide the gymnast with the necessary information to control his or her movements with regard to the apparatus (cf., Bradshaw, 2004). However, a continuous time-to-contact calculation is only functional if the gaze is fixated on the apparatus. A fixated gaze may lead to a more accurate time-to-contact estimation when a gymnast moves to intercept objects in the visuo-motor workspace (Hecht & Savelsbergh, 2004).

Different gaze directing strategies do not differ in their effect on judged movement quality because both experimental groups outperformed the control group with regard to movement quality in the retention tests, but did not differ from each other. However, there could be an additional, yet not directly observable, effect on movement kinematics, which was revealed in the group differences for the horizontal run-up, and the take-off velocity at the end of the repulsion phase, as well as the duration of the second flight phase. Research shows, that often only a few parameters are significantly related to judge’s scores and that in general a large portion of judge’s score variance remains unexplained by the variance in movement kinematics in gymnastics skills and vice versa (e.g. Takei, 1989, 1990). In general these differences are attributed to differences in execution and artistry of presentation of skill performances, or to differences in other kinematic parameters, that are not covered by the judging guidelines. This view is further supported by the fact, that only two out of ten kinematic parameters in this study were significant predictors of judge’s scores (explained variance = 41%), and group differences between the two experimental groups and the control group were found in two out of the five parameters.
Table 2. Participant’s kinematic parameters (means ± standard errors) of the handsprings on vault in the post- and retention-test (CG = control group; IG = instruction group; IVG = instruction + visual cues group, CM = center of mass)

<table>
<thead>
<tr>
<th>Movement Phase Variable</th>
<th>Post-Test</th>
<th>Retention-Test</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG MW ± SD</td>
<td>IG MW ± SD</td>
<td>IVG MW ± SD</td>
</tr>
<tr>
<td><strong>Run-Up &amp; Take-Off</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal CM Velocity</td>
<td>3.24 ± 0.27</td>
<td>3.87 ± 0.28</td>
<td>3.56 ± 0.27</td>
</tr>
<tr>
<td><strong>First Flight Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angular Momentum</td>
<td>63.52 ± 4.90</td>
<td>60.22 ± 4.90</td>
<td>61.35 ± 4.90</td>
</tr>
<tr>
<td>Support Angle</td>
<td>22.20 ± 5.13</td>
<td>21.43 ± 5.12</td>
<td>18.10 ± 5.12</td>
</tr>
<tr>
<td>Phase Duration</td>
<td>0.13 ± 0.02</td>
<td>0.11 ± 0.02</td>
<td>0.11 ± 0.02</td>
</tr>
<tr>
<td><strong>Repulsion Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase Duration</td>
<td>0.51 ± 0.02</td>
<td>0.48 ± 0.02</td>
<td>0.51 ± 0.02</td>
</tr>
<tr>
<td>Take-Off Angle</td>
<td>112.80 ± 3.81</td>
<td>109.36 ± 3.81</td>
<td>119.61 ± 3.81</td>
</tr>
<tr>
<td>Moment of Inertia at Take-Off</td>
<td>8.71 ± 0.42</td>
<td>8.66 ± 0.41</td>
<td>8.12 ± 0.41</td>
</tr>
<tr>
<td>Horizontal CM Velocity</td>
<td>1.73 ± 0.09</td>
<td>1.95 ± 0.09</td>
<td>2.04 ± 0.09</td>
</tr>
<tr>
<td><strong>Second Flight Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase Duration *</td>
<td>0.31 ± 0.02</td>
<td>0.35 ± 0.02</td>
<td>0.33 ± 0.02</td>
</tr>
<tr>
<td><strong>Landing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moment of Inertia at Touch-Down</td>
<td>9.47 ± 0.30</td>
<td>8.57 ± 0.29</td>
<td>8.41 ± 0.29</td>
</tr>
</tbody>
</table>

Note. * Significant main effect of Group (p < .05): The instruction group showed higher values than the control group. ** Significant main effect of Group (p < .05): The instruction group and the instruction + visual cues group showed higher values than the control group. Μ Significant product-moment correlation (p < .05) between performance rating scores and kinematic parameters.
From the results of this study, it is concluded that both gaze directing strategies are equally effective in facilitating the learning of a complex skill when the criterion is the observed movement quality, rather than the underlying movement kinematics. Regarding the movement kinematics, it is concluded that it is not necessary to provide the learner with additional visual cues because it was shown that the instruction group differed from the control group in the horizontal run-up velocity and horizontal center of mass velocity at the end of the repulsion phase, but the instruction + visual cues group did not differ from the control group in these two parameters.

Participants in the current study were Sport Sciences students. One could argue that when working with young gymnasts, it could be more beneficial to use external visual cues rather than instructing them explicitly when and where to direct their gaze (Masser, 1993). This may be due to the fact, that young learner’s visual attention could possibly be captured more easily with external cues (Kan & Thompson-Schill, 2004). This could lead to better perceptual judgments, which in turn could lead to a more accurate action response (cf., Klevberg & Anderson, 2002). Manipulating informational constraints during learning is therefore seen as a potentially useful instructional strategy for young learners, as it encourages them to exploit different sources of information that help guide their actions. This kind of approach appears to have practical utility for facilitating exploratory activity in children (Williams, Weigelt, Harris, & Scott, 2002). It can be argued that the instructions used in this study helped learners to focus attention because vision is usually the dominant sensory source for learners and it often dominates when vision is in conflict with other sensory sources (McGurk & Power, 1980).

Several limitations in this experiment need to be taken into account. First, experts’ gaze behavior in handspring on vaults was analyzed and used to generate specific instructions for the novices in this experiment. Research shows that, in general, instructions are more effective when they are given as metaphors rather than as explicit rules (e.g., Wulf, Lauterbach, & Toole, 1999). However, the instructions in this study were more explicit in nature than metaphoric because they were constructed in the following form: “Try to fixate your gaze to A during B”. A was substituted by the gaze behavior area of interest (see Table 1 and Figure 1), and B was substituted by the corresponding movement phase. Giving metaphoric rules for gaze behavior is not possible for every movement phase in the handspring on vault and, because of this, it was decided to only give explicit rules on gaze behavior. A subsequent study should incorporate different forms of gaze behavior instructions in its design.

Second, neither learner’s gaze behavior, nor learner’s focus of attention was measured in this experiment so one cannot be sure whether the gaze behavior instructions did in fact change the learner’s gaze behavior and whether they only influenced the learner’s visual attention or both. A subsequent study should try to incorporate the measurement of gaze behavior in its design in order to control the intended effect of gaze behavior instructions.

There are some practical consequences and implications that can be made from the conducted study. It was shown that perceptual instructions facilitate the learning of a complex skill. Assuming that athletes can extract specific, movement-related information by fixating their gaze on distinct areas, the coach should encourage learners to
intentionally use visual spotting during the acquisition of a handspring on vault. Especially because additional empirical evidence from well-learned tasks suggests that nearly all fixations are task-relevant and only a small fraction of them are task-irrelevant (Land, Mennie, & Rusted, 1999). Using visual spotting in a structured way could help athletes to spend more time in exploring the movement structure rather than in searching for information-rich areas in the environment. From a psychological point of view, perceptual instructions provide the learner with a distinct action structure (cf., Singer, 2002), which can guide their actions and help them keep their focus in case of occurring uncertainty. Knowledge about the effects of directing the learner’s gaze in skill acquisition and retention may help coaches develop specific training programs for the learning process of the handspring on vault in gymnastics.

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REFERENCES


GROUP COUNSELING FOR SPORTS TEAMS: A CONCEPTUALIZATION LINKED TO PRACTICE

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ABSTRACT

There is a paucity of literature addressing a link between group counseling and sport teams. Given that a sport team is a system comprised of individual athletes who typically attempt to perform optimally and have positive life experiences, it is somewhat surprising that the utility of group counseling has not been addressed in the literature, particularly given group counseling’s ability to enhance intrapersonal, interpersonal, and group-as-a-whole functioning. The current article addresses this and attends to applied characteristics of group counseling with sport teams. We also provide an example from a group counseling experience with a sport team at a university (i.e., NCAA Division I) to illustrate this linkage.

Keywords: sport psychology, counseling psychology, athletics, systemic interplay, process orientation.

It has been argued that a sport team consisting of a group of individual experts does not necessarily make an expert team (Eccles & Tenenbaum, 2004). An ecologically valid example that supports this contention can be found in the results of the 2004 men’s Olympic basketball tournament where the United States team won a Bronze medal (i.e., 3rd place) while arguably having the most impressive roster of individuals. Researchers have reported that the factors influencing this occurrence, and any team’s performance level, include group coordination, communication, and organization, all of which interact in a complex manner (Hinsz, Tindale, & Vollrath, 1997; Hutchins, 1991). Interventions that enhance intrapersonal, interpersonal, and group-as-a-whole functioning can help in domains with such complex interactions (e.g., sport teams). Group counseling has such a focus.

A competitive team is likely aware of the benefits of maximizing group-as-a-whole functioning, yet its members may not be as aware of the impact of intrapersonal and interpersonal transactions. Group counseling can positively impact these latter two
systemically oriented transactions. The systemic functioning of a team (e.g., basketball, soccer, or cheerleading) and the life experiences of individual team members may benefit from incorporating periodic (e.g., weekly) group counseling sessions. The purpose of this article is to provide theoretical and applied evidence supporting this contention, and assistance to those who wish to engage teams in group counseling. The current article strives to achieve this purpose by identifying congruencies among a team’s goals of optimal performance and positive experiences for their athletes, and group counseling’s goal of improving the emotional and mental health of human beings.

The interest in group counseling has increased dramatically over the past few decades (Corey, 2008). This popularity is likely due to a number of reasons, ranging from the ability of group counseling to simultaneously intervene at, and effectively impact several levels of the human experience (e.g., intrapersonal, interpersonal, and group-as-a-whole; Cohen & Smith, 1976; Dreikurs, 1951), to its cost effectiveness (i.e., lower capital outlay per person than individual counseling). Additionally, the types of groups that can be formed are limited only by the clinician’s imagination. Based on these facts it is somewhat surprising that there is essentially no literature directly addressing group counseling and teams. Although the literature addresses very important topics such as the effectiveness of group counseling for collegiate women who have recently retired from athletic competition (Constantine, 1995), it does not include empirical investigations nor theoretical papers attending to the use of group counseling with teams. Sport psychology research to date primarily addresses an individual’s cognitive processes and how these processes impact the individual’s performances, not the team’s (see Eccles & Tennebaum, 2007 for a review).

Group counseling focuses on the growth, development, and enhancement of group members’ functioning and on the group’s functioning. Group counseling tends to focus on the client’s defenses, perceptions, and distortions, as well as the critical importance of within group processes. Additionally, the collaborative relationship between, and distinct roles of the group leader and the group members differs when compared with other group helping techniques. Group counseling, group therapy, psychoeducational groups, consultation, and task or work groups differ. Group therapy tends to be primarily concerned with the process of reeducation in order to enhance group members’ remediation treatment or personality reconstruction. Psychoeducational (i.e., structured) groups tend to be centered on a specific theme or a particular population of individuals (e.g., victims of domestic violence, HIV/AIDS support, and children of alcoholics). See Ray and Wiese-Bjornstal (1999) for an example of group health education counseling. Consultation may be the superior method when ameliorating a specific team issue. For example, Parcover, Mettrick, Parcover, and Griffin-Smith (2009) implemented a consultative relationship between their college counseling center and that college’s athletic teams utilizing a family systems therapy model, as did Zimmerman and Protinsky (1993). And lastly, task or work groups are implemented with the goal of maximizing a group’s ability to accomplish a particular charge. Although task or work groups’ foci are highly congruent with the performance goal of an athletic team, the group processes, whether interpersonal or intrapersonal, engaged in are almost solely related to the group’s objective performance.
The implementation of group counseling with athletic teams warrants care as this is not a process that is indicated with all types of groups in all situations (Ward & Litchy, 2004). Consideration must be given to a number of ethical concerns, some of which are addressed within the case presented shortly. A more in-depth discussion of ethical issues in the practice of sport psychology are supplied by Anderson, Van Raalte, and Brewer (2001) and Aoyagi and Portenga (2010), among others.

**THE EFFECTIVENESS OF GROUP COUNSELING WITH TEAMS**

Relationships among members of a team likely impact the level of that group’s functioning (e.g., performance) and the individuals’ subjectively perceived life-experiences (e.g., emotional and intellectual health). The ability of group counseling to enhance the chances of achieving these goals occurs via its focus on helping individuals improve their self-trust and trust of others; self-awareness and environmental-awareness; ability to recognize others’ needs (e.g., the need for interpersonal connectedness); relationship building skills; capacity to identify within-group resources; self-acceptance, self-confidence, and self-respect; constructive self-expression and interpersonal communication; and conflict resolution skills (Corey, 2008). Additionally, group counseling has these foci when in use at agencies, schools, inpatient settings, private practice, community organizations, business, and industry (Trotzer, 2006). Group counseling principles are clearly utilized in settings that are directly related to organized athletics (e.g., academic institutions) and generalizable to teams (e.g., business). This latter assertion of generalizability from industrial/organizational (I/O) settings to teams finds explicit support in the literature (Weinberg & McDermott, 2002). Furthermore, milieus such as high schools and possibly middle schools (e.g., school psychologists and school counselors; Mintz, 2005), and colleges (e.g., university counseling centers and athletic departments), appear to be well positioned to provide this service due to their already existing systems and structures (Smith et al., 2007).

Group counseling may not be a method of performance enhancement that initially comes to the minds of those who practice group counseling or administrate competitive teams. However, sport psychologists and sport psychology consultants, particularly those with training in school psychology, counseling psychology, and group counseling, work within a domain that has a philosophy harmonious with that of group counseling. For example, sport psychologists tend to work in the here-and-now (Ravizza, 2002). That is, one’s past experiences are recognized as possibly playing a role in his or her subjective perceptions and experiences, yet it is the here-and-now that clients can impact. This philosophy deemphasizes control, thereby permitting the mind to transcend the ego and allowing an individual to become totally immersed in the performance (Ravizza, 2002). Improving self-awareness and one’s awareness of environmental factors are also goals of group counseling. Moreover, group counseling and sport psychology utilize techniques fundamental to a number of theoretical orientations. This permits group counseling to be implemented with any number of specialized groups (Vinogradov, Cox, & Yalom, 2003).
For those groups, and in those situations in which group counseling can reasonably be implemented, the following section offers clinicians a basis from which they may work. This presentation integrates Corey’s (2008) six stages of group development with a real world case study. This presentation briefly discusses potential ethical, humanistic, and performance enhancing aspects of group counseling with a sport team. Additionally, the case study herein involves a university athletic team (i.e., NCAA Division I) in the United States.

**GROUP COUNSELING WITH TEAMS: A LINKAGE BETWEEN THEORY AND APPLIED WORK**

In order to optimize the foci of group counseling (i.e., intrapersonal, interpersonal, and group as a whole processes) with teams, there are a number of unique factors of which the group leader should be aware. If appropriately attended to, the group counseling process is more likely to positively impact both the team’s within group dynamics and individual team members’ defenses, perceptions, and distortions (Corey, 2008). Additionally, this presentation relies on empirical work from both group counseling and I/O psychology in order to link group counseling concepts and sport psychology. The I/O psychology research is utilized herein because of its extensive history investigating group functioning.

In order to ensure participant confidentiality, the team herein is referred to using consistently anonymous terminology. For example, the athletes’ gender, sport, specific rules, and number of players are purposely omitted to assure participant confidentiality. Additionally, the authors of this article are not currently involved with the university at which this group counseling experience took place. It is also important to stress that this case is unique due to a variety of individual (e.g., the group leader, the university’s culture, the culture of the athletic department and sports in the U.S., the head coach’s subjective perceptions and objective experiences) and systemic factors distinctive to the context within which and when this experience occurred. In no way should this case study be construed as the only manner in which group counseling with a team must be realized. It is acknowledged that no two group counseling milieus are identical.

The psychologist who led the group counseling services in this case is one of the authors of this article. He is a licensed psychologist who has over 10 years of experience in applied sport psychology. Prior to the experience described herein this individual had worked with the participant team for one year and he led this group experience without an assistant group leader. The team’s head coach was in his second year at the university and he had previous experience as a collegiate coach. In the coach’s previous position this individual had exposure to sport psychology services, which were reported to be less than satisfactory. Furthermore, the participant team described herein consisted of a majority of new players, almost half of whom were in high school the previous year. Moreover, almost all of the team’s starters were new to the university. In order for the opportunity to include this team’s group counseling experience within this article, all
appropriate ethical standards were adhered to, including confidentiality. We begin with Corey’s (2008) Stage 1.

**Stage 1: Pregroup Issues – Formation of the Group**

Stage 1 involves addressing a number of issues that are similar among most groups, and others that are unique to the competitive athletic environment. The overriding principle in Stage 1 is that the effectiveness of the group counseling experience is likely negatively impacted by poor planning. However, a successful group counseling experience is not assured by optimal planning. Effective group formation merely provides a sound basis from which positive intrapersonal, interpersonal, and group-as-a-whole advancement may occur. Moreover, just as with any specialty group setting, consideration must be given to the unique cultural aspects of sports in general, as well as within many teams. Tuckman (1965) termed this the initial aspect of the “forming” stage.

Forming a group will be different when working with a team than when working in most traditional group settings. First, instead of screening individual members, the initial screening process in this case involved discussions with the team’s head coach. Later in Stage 1, team members were brought in to participate in the group counseling process. It has been our experience that at the intercollegiate level, access to teams is almost wholly controlled by the team’s head coach. Therefore, we believe that developing a constructive relationship with this person is critical. The agreed upon procedures, assessment measures to be used, structure, needs of, and goals of the group counseling experience were addressed with the head coach during this stage. This was done in part for ethical reasons. For example, the American Psychological Association’s (APA) code of ethics (APA, 2002) states, “When psychologists provide services to several persons in a group setting, they describe at the outset the roles and responsibilities of all parties and the limits of confidentiality” (§10.03). Navigating these ethical principles; the logistics associated with group counseling for a sport team; the communication of appropriate informed consent; and the counseling interests of individuals relevant to the team (e.g., coach) may be challenging, but if successfully navigated will enhance the group’s potential for reaching the mutually held goals of group counseling and sport psychology.

When determining a team’s potential fit with group counseling, a clinician who is considerate of the team’s implicit and explicit organizational structures improves the chances of a successful group experience. Logistically, and as we found, the group would likely be closed and of a defined size, which are parameters determined by the team that will participate. Additionally, potential meeting locations may differ from traditional clinical settings (e.g., a team’s locker room or athletic department meeting room). Meeting duration and frequency will depend on preferences of people, such as the coach and the rules dictated by administrative bodies. In this case, the group leader focused his meetings with the coach on setting expectations and developing a relationship. In close consultation with the head coach, it was determined that group meetings would occur on a variable schedule based on when the coach and/or group leader felt the need and as the
team’s practice/game schedule permitted. However, the leader attended practices several times a week to be aware of intra-team dynamics and individual behaviors.

A decision on the leadership style selected by the group leader is also of importance during this stage, and may benefit from an awareness of idiosyncrasies associated with clinical work associated with competitive teams. First, the leader’s personality style and its fit with the team of interest must be evaluated. Second, an understanding of the effective leadership styles associated with teams is invaluable. Originally, empirical investigations of leaders and leadership were performed from a trait-based perspective. Since this perspective does not account for situational variance in leadership behavior, there has been an increased focus on the systemic interactions among an individual leader’s traits and the situation or environment (Hersey & Blanchard, 1974; House, 1971; Kirkpatrick & Locke, 1991; Yukl, 1971). A group leader who can recognize a particular team’s existing task difficulty and interpersonal relationships will greatly aid the delivery of group counseling services. In addition, practitioners who engage in group counseling with teams should have a thorough understanding of their theoretical orientation and how they conceptualize group work. The next five stages of group work can be engaged only after these initial pre-group tasks have been adequately addressed.

A final possible consideration is to select an appropriate assessment tool. Assessment tools have the potential to provide benefits in two ways. First, they provide feedback to the group regarding intragroup processes (e.g., cohesion), which can be correlated with objective measures of the team’s performance. This feedback can provide team members and coaching staff with concrete data supporting their participation in group counseling. Second, this data can aid the limited literature addressing the effectiveness of group counseling with teams. Although there currently are no group counseling assessments for teams, two possibilities that a group leader could use are the Team Learning Beliefs and Behaviors Questionnaire (TLBBQ; Van den Bossche, Gijselaers, Segers, & Kirshner, 2006) and the CORE-R Battery (Burlingame et al., 2006).

**Stage 2: Initial Stage – Orientation and Exploration**

In order to decrease dropout rates and increase the effectiveness of a team’s group counseling experience it is important that during initial sessions, group leaders review confidentiality, group norms, and procedures (Yalom, 2005). Additionally, efforts to alleviate any individual members’ expectations, anxiety, or concerns are recommended (Bowman & DeLucia, 1993). When working with teams it is important to clarify confidentiality issues relating to group and non-group members (e.g., the coach). For example, Stage 2 likely will include a discussion of the importance of trust in the group process (e.g., the coach having previously agreed to within-group confidentiality). Such confidentiality discussions occurred during our work with the team described herein.

Corey (2008) recommends that group leaders explicitly discuss two additional factors with participants during Stage 2 in order to facilitate group members’ future explorations: their understanding of the group process and their level of investment in this process. During this case’s first meeting with the team, the group leader was introduced to the
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athletes by the head coach and then he observed practice. Upon the conclusion of practice
the group leader scheduled the initial group counseling sessions. The first group
counseling session consisted of an introduction to the group process, including
confidentiality, an overview of psychological skills training (PST) for sport (see Hardy,
Jones, & Gould, 1996, for an overview), identifying the importance of self-assessment,
and an emphasis on what the leader calls, “What’s in your boat?” With this question the
leader essentially encouraged each athlete to evaluate what an individual can control or
contribute to, and what that person cannot. Verbalizations in the here-and-now about
team members’ thoughts and feelings were encouraged to help each athlete learn to trust
the group leader, his or her teammates in a novel environment, and him or herself.

During the second and third sessions a number of issues were addressed. The group
leader worked toward having the players identify what impedes them from maximizing
their individual and team performances. Additionally, self-confidence and its meaning
were discussed. In the third session a transition took place. The didactic feel of the first
and second sessions was replaced by that of a more traditional group counseling
experience. That is, the focus from this point forward involved group needs and
individual self-disclosure. Group participation was discussed and agreed upon (i.e., group
membership was mandatory yet participation was voluntary), as was the goal of
identifying a purpose for the group. Opportunities for the athletes to speak without the
coaches present also occurred. Members’ roles in the group were discussed, including
that of the leader. The athletes were encouraged to clarify their role in
the group based on each individual’s willingness to participate rather than on their roles in the competitive
milieu.

Forming and/or identifying the group’s goals was also broached during this stage.
Goals are deeply integrated within the team system and are salient to performance
(Roberts, Treasure, & Conroy, 2007), with superordinate goals appearing to be most
important (Aronson, Blaney, Stephin, Sikes, & Snapp, 1978; Sherif, Harvey, White,
Hood, & Sherif, 1961). Having a group of athletes identify their goals tends to provide
insight into the individuals’ emphases on outcome goals or process goals, or both.
Awareness of potential conflicts among individuals’ goals (e.g., two players desiring one
position, for example, starting goalie, as but one example) deserves a group leader’s
attention. Tactfully addressing and processing issues such as these is important because,
as Bandura’s (1986, 1997) social cognitive theory identifies, an individual can suitably
self-regulate only after he or she can set goals, self-observe, self-evaluate, and self-direct
(i.e., a systemic relationship exists among these factors). Appropriate self-regulation has
a strong relationship with enhanced performance (Edmonds, Tenenbaum, Mann, Johnson,
& Kamata, 2008) and quality of life. Therefore, carefully managed group discussions that
illuminate any within-group congruencies and disagreements will likely lead to improved
group functioning.

A number of factors can impact the goal setting process and individuals’ successful
group participation. First, Locke (1968) identified that in order to maximize group
performance; goals that are moderately difficult, measurable, and specific are preferred.
Second, goals that are set by members of the group have been shown to be more
challenging than goals set by a superior. Additionally, if affect is expressed during the
goal setting process it can play two significant roles: it provides a source of information about the group to group members, and it fosters group bonds and loyalty (Spoor & Kelly, 2004).

Permission to adjust the group’s goals also must be available throughout the life of the group. Leaders play a role via the intervention and challenging skills they employ. In addition, modeling concepts such as honesty, genuineness, respect, and spontaneity will help group leaders facilitate the group’s ability to achieve its goals. Further dynamics distinct to group counseling of teams also likely will be realized during the third (i.e., transition) stage.

During the first month of our work with the team described herein, it developed a highly interactive communication style. Members engaged in cross-talk and used confrontation to facilitate communication. However, a discussion of termination, which is usually and should be included from the beginning of any counseling relationship, did not occur within this team’s group counseling experience. Additionally, only a single post-season group counseling session was held.

Stage 3: Transition Stage – Dealing with Resistance

Members of a team will enter group counseling possessing different levels of comfort with change. This can present unique challenges for a group leader as some athletes on a given team may not feel that any change is needed (e.g., the starting point guard on a basketball team). Dealing with group members’ fears and ambivalence, while making members’ internal dialogue explicit, is likely best approached directly while the group leader models support. Any such expressions that occurred during the case study presented herein were addressed in this manner.

Intragroup discussions of resistance are important. Interpersonal relations during Stage 3 can influence the team’s group outcomes. There are certain theories from I/O and social psychology that provide assistance with conceptualizing and operationalizing interpersonal group counseling work with teams. For example, decisions arrived at by a group of people are likely superior to any one individual’s when the skills of the group members are heterogeneous and the task is complex (Michaelson, Watson, & Black, 1989). However, concern is warranted. Groupthink (Janis, 1982) is one potential pitfall. A group leader who encourages healthy questioning of the group’s currently held views can decrease the likelihood of groupthink, and thereby work through this stage, which also is referred to as the storming stage (Tuckman, 1965). Group leaders who encourage brainstorming (i.e., members sharing their ideas while others are prohibited from any evaluation until those ideas are fully presented; Froehle, Mullen, & Pappas, 1999) likely will facilitate a team’s functioning (Eccles & Johnson, 2009). The quality of the resultant ideas and interpersonal relations may only be able to impact performance if ideas from brainstorming are available to all team members, or to some subset of the group (e.g., offensive linemen on a football team).

Strategies designed to effectively address resistance during group counseling (Chin & Benne, 1976) that could be effective with teams include addressing an individual’s self-
interests, social norms, and authority. As identified by French and Raven (1959), group leaders who utilize expert, legitimate, and/or informational power will have a higher likelihood of effectively facilitating organizational change and team development. Based on this, a group leader for the current case made every effort to understand the team’s sport very well (e.g., performance level, culture, and rules). Furthermore, the group leader focused on developing a firm understanding of the effectiveness of any psychological skills specific to this team’s sport.

Stage 4: Working Stage – Cohesion and Productivity

Trust, acceptance, empathy, intimacy, hope, catharsis, cognitive restructuring, commitment to change, self-disclosure, confrontation, and feedback are all part of the working stage. These intrapersonal, interpersonal, and group-as-a-whole experiences can impact a team’s performance and team members’ quality of life (Corey, 2008), and are therefore prime factors of interest in both group counseling and sport psychology. Moreover, these characteristics can only be effectively addressed if the first three stages of group development were properly dealt with.

When thoughts and feelings flow freely within a group and the fourth stage (i.e., norming stage; Tuckman, 1965) has been reached, then the motivation underlying decisions and behaviors can be investigated more fully. If motivators are considered to be those factors that activate and sustain goal directed behavior, then a leader who enables the group members to freely share their motives within a supportive and non-judgmental environment will be facilitating the achievement of the group’s goals. The concept of motivation as it specifically applies to sport is important as it has a strong relationship with performance (Roberts et al., 2007; Vallerand, 2007). However, this literature once again focuses on the individual and not group motivation. Research from other domains that emphasize group process (e.g., I/O psychology) has uncovered a positive relationship between motivation and group performance. Examples include Herzberg’s (1966) 2-factor theory, Lewin’s (1936) field theory, and Porter and Lawler’s (1968) and Vroom’s (1964) expectancy theory. Furthermore, a high level of affiliation (i.e., a type of interpersonal relationship) is considered a vital intrinsic motivator (Stevens & Fiske, 1995). Schachter (1959) investigated this and the idea that “misery loves company.” He concluded that perhaps a more accurate phrasing is “misery loves miserable company.” That is, people appear to prefer the company of those who they perceive to be having experiences similar to their own. A team’s culture, experiences, and gender composition (Deaux, 1978; Latane & Bidwell, 1977) will influence the types of affiliations experienced within the group and as such should play a role in the group leader’s decisions. Armed with a working awareness of concepts such as these, a group leader is well equipped to facilitate a team’s progress toward meeting its goals.

There also exist lines of evidence supporting the relationship between a group’s coordination and its performance (e.g., Entin & Serfaty, 1999; Rasker, Post, & Schraagen, 2000; Smith-Jentsch, Zeisig, Acton, & McPherson, 1998; Stout, Cannon-Bowers, Salas, & Milanovich, 1999; Ward & Williams, 2003). Two aspects of group
coordination (i.e., cooperation and cohesion) have been extensively researched and are applicable to group counseling of teams. Cooperation and cohesion are directly related to group norms and are part of the systemic interactions that impact a team’s performance, with cohesion having a moderate to high relationship with team performance (Carron, Colman, Wheeler, & Stevens, 2002). Although from a study that included a single team (Holt & Sparkes, 2001), there appear to be four key themes that influence team cohesion: individuals having clear and meaningful roles, a willingness to make personal sacrifices, high levels of communication, and minimally ambiguous team goals. Additionally, there is support for the highly complex relationship between a group’s cohesiveness and its productivity. When team members participate in setting group goals and norms, when individuals must depend on one another, and when team members understand that personal interests will be achieved via the attainment of the group’s goals, then higher group cohesion and performance tend to result.

Adding to the complexity of the cohesion-performance relationship is the existence of differing types of team cohesion. Hardy, Eys, and Carron (2005) examined social cohesion (i.e., how well group members get along with and support each other) and task cohesion (i.e., the level of cooperation a group exhibits relevant to a specific behavioral goal). A majority of the athletes polled by Hardy and his colleagues reported possible team performance disadvantages associated with high social cohesion. Alternatively, only 31% reported possible team performance disadvantages to high task cohesion. Therefore, there appear to be forms of team cohesion that are somewhat orthogonal to each other relative to team performance. A group leader’s awareness of the level (i.e., high or low) and type (i.e., social or task) of cohesion that a team exhibits, and how team cohesion evolves during a competitive season, are important issues that will influence the effectiveness of group counseling for a specific team.

Group counseling also has the ability to impact both the cognitive and affective information shared within a system (i.e., team communication). This has clear implications for a team’s performance and can be processed within a group counseling setting (Stout et al., 1999). Stasser and Titus (1985) found that information that is available to only one member of a group tends to be treated as unsupported opinion. However, when more than one member possesses a piece of information, discussions are more likely to ensue, improving a team’s communication. Ultimately then, it appears that when a system emphasizes shared communication among group members, and when this “sharedness” is simple, explicit, and concrete, the likelihood of improved team performance is greatly enhanced (see Eccles & Tenenbaum, 2007, for a review).

One of the primary reasons for bringing this case study into the present article is to share an event that the group leader felt was critical to the team’s eventual performance; possibly due to assiduously attending to Stages 1 through 3; important as it relates to the athlete’s individual growth; and an illustration of an effective intervention used by the group leader. It is the opinion of the group leader, which was affirmed by the coach, that the primary reason the team was able to overcome this critical event during their season was due to the relationship built throughout the year.

Midway through the season, the team had lost more than twice the number of games it had won. The team members and coaches identified that ability levels were exceeding
performance, for both the individuals and the team. During group sessions the athletes expressed frustration about the head coach’s tendency to be controlling over most every aspect of their lives, both in the competitive milieu and away from it. The coach and athletes both reported that during competitions the athletes appeared tight and they were performing poorly on basic skills. Moreover, the athletes identified that they were not performing as a cohesive unit. Essentially, the athletes’ behaviors during competition were self-described as “playing afraid.”

The day before a competition the athletes came to a consensus that they wanted to speak with the head coach about their concerns. They requested that the group leader approach the coach. The group leader agreed that it was important for the team members to share their feelings with the coach, but that it was just as important that the athletes be the ones to approach the coach. The athletes agreed with this, and then asked the coach for time during practice to discuss their current feelings. The coach agreed to a 15 minute meeting in order to listen to the athletes without interrupting them. What ensued was a two hour meeting among the coaches, athletes, and group leader. The athletes expressed their concerns with an emotional freedom that heretofore had been absent. This single session included confrontation, laughter, tears, and a lot of feedback provided to the coaching staff from the athletes. At the end of the session the coaches and athletes agreed to embark on a fresh start. The coach stated that he would treat the athletes as young adults from this point forward, and the athletes said they would commit to respecting the coach’s decisions in the competitive milieu. Once that meeting concluded there were approximately 15 minutes of practice time remaining to prepare for the next day’s opponent.

The following day the team played a very competent conference opponent and won by a large amount, starting the game quickly and jumping to a big lead early. The athletes appeared to be competing with more confidence and a high level of task cohesion. Both the coaches and athletes reported a heightened level of effort and a willingness to take risks, providing support for the purposes of this article. During the remainder of their season the team won more than twice as many games as they lost. Additionally, the team won its conference tournament, defeating the multi-year defending champion and earning the university’s first ever trip to the NCAA Division I Tournament. Moreover, the head coach reported being very pleased with the team’s group counseling experience. This brings the current article to the fifth stage described by Corey (2008): consolidation and termination.

Stage 5: Final Stage – Consolidation and Termination

The topic of termination itself provides a potentially powerful opportunity within the context of the group process. Discussion regarding a season ending event, whether planned or unplanned, could lead to powerful intrapersonal, interpersonal, and group-as-a-whole development. However, unlike many other types of groups, termination for teams may be experienced abruptly due to explicit or implicit reasons. Teams and their members may be predisposed to focus on season ending competitions to such a degree
that a less-than-optimal amount of time is spent processing what occurs immediately thereafter. However, scheduling group sessions following the competitive season is highly recommended. During consolidation and termination sessions, best practices encourage a review of the group experience and the team’s performance goals; the processing of any feelings associated with separation; giving and receiving feedback regarding individuals’ subjective group experiences (i.e., for both the person as an athlete and as a non-athlete); and reaching agreements regarding what will be done during the “off-season.” In the case study presented here, only a single termination group counseling session was held. During this session the athletes shared their appreciation of the group counseling process and each other.

This final stage can be difficult for clients, particularly if they have a strong ego involvement in their sport and their team, or if they are leaving the group for good (e.g., a college senior who has competed for his or her university for the final time). Group leaders are encouraged to utilize techniques that facilitate members’ ability to express their feelings regarding termination. Those athletes who will not be returning to the team may wish to share what they will miss about not being part of the group. Furthermore, those who will be returning could benefit themselves, others, and the group-as-a-whole by sharing how they feel toward those who will not be returning. Following these interpersonal disclosures addressing termination with discussions regarding the life skills and coping strategies members gained during the competitive season could reap multi-level benefits. Overall, the goals of facilitating intrapersonal, interpersonal, and group-as-a-whole functioning; improving individual and team performance levels; and advancing members’ quality of life, should be reviewed during the group’s final few meetings. Implementing the objective measurement tool(s) that was selected in pregroup planning is one way to evaluate these thoughts, feelings, and behaviors, augmenting other sources of feedback regarding the group counseling term. Furthermore, assessment tools provide future directions for both practice and research via potential outlets such as scientific journals and conference presentations at which these results are shared.

Stage 6: Postgroup Issues – Evaluation and Follow-up

In this concluding stage objective performance and subjective impressions of group and group member experiences are reviewed. Implementing an appropriate follow-up plan that reflects upon the objectives identified during the initial two stages, as well as how the team’s goals changed during the competitive season, occurs at this time. Additionally, future considerations and ideas can be addressed in these follow-up meetings. With a team, at least one debriefing session with the coach and/or players is recommended.

A meeting with the head coach, and any assistant coaches who the head coach desires be present, is likely very important to the future relationship between the team and the leader. Within these meetings any objective performance and subjective impressions pertinent to the team and the staff should be discussed. The clinician who can bring these discussions into an explicit conversation and do so in a non-threatening manner will likely benefit all involved.
In this case study a meeting with the head coach occurred. This individual meeting allowed the leader and head coach to process the season’s events one last time, and prepare for the next season’s Stage 1.

A final point of emphasis at this stage involves evaluating the impact the group experience had on the group leader. Sport provides a rather unique environment that tends to accentuate objective win-or-lose outcomes (i.e., a zero-sum situation). Allowing an outcome based perspective to be the major indicator of the success level of a process group is problematic. A group leader who engages in activities that enhance his or her self-awareness relative to these, and other issues germane to his or her work in the sport domain in general, and in a team environment in particular, likely will benefit the group leader in the present and in the future via an improved quality of life and a greater ability to deliver services.

**SUMMARY**

Although only a single instance, this case study provides a line of evidence supporting the potential effectiveness of group counseling with teams. However, it also illustrates some of the unique accommodations that must be made for the athletic environment. When compared with a more traditional group counseling service provision, there are a number of issues unique to teams involved in group counseling. Group leaders must be aware of these (e.g., distinctive ethical, confidentiality, and dual role situations often must be navigated). Some of the more critical issues include the coach “buy-in” to both sport psychology and group counseling, and the relationship between the group leader and the coach. Weaknesses in either of these critical areas may result in a less than desirable group counseling experience.

**CONCLUSION**

Any system that involves two or more people and their goals, strategies, and behaviors relative to maximizing athletic performance, likely will be complex. A team that engages in group counseling can improve its performance via team members’ enhanced self-awareness and interpersonal skills. Corey’s (2008) six stages of group counseling are used in a number of graduate training programs due to their effectiveness. This holds promise for teams as well as other groups, provided that these stages are followed in an ethical manner that accounts for the unique challenges presented by sports.

**REFERENCES**


