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The relationship between coaching behaviors and athletic injury

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The Relationship between Coaching Behavior and Athletic Injury

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PUBLIC PRESENTATION

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Abstract

The present study sought to expand on past research by examining the relationship between coaching behaviors (i.e., controlling coaching and autonomy-supportive coaching) and athletic injury. One hundred Division I athletes were given a battery of questionnaires, in the form of a single Qualtrics survey to assess the relationship between coaching behaviors and athletic injury. Controlling coaching was found to be positively correlated to the presence of pain and certain perceived causes of injury, as well as negatively correlated to athletes discussing their injury with their coach and the coach being an influence in athletes' decision to return to their sport. Autonomy-supportive coaching was shown to be positively correlated to athletes discussing their injury with their coach and one's coach being an influence in their return to their sport. As such, this study supported past research in showing that autonomy-supportive coaching is related to more adaptive outcomes than controlling coaching behaviors. Therefore, it is recommended that coaches use autonomy-supportive coaching in order to enhance the psychological, as well as physical well-being of their athletes.

The Relationship between Coaching Behaviors and Athletic Injury

Positive Psychology Coaching has been defined as an approach to coaching that seeks to improve shot-term and sustainable well-being (Passmore & Oades, 2014). This approach incorporates four theories: (a) Strengths Theory (Proctor, Maltby, & Linley, 2011); (b) Broaden-and-Build Theory (Frederickson, 2009); (c) Well-being Theory (Seligman, 2011); (d) Self-Determination Theory (Deci & Ryan, 2000). The bulk of the research examining positive psychology coaching is grounded in Self-Determination Theory, notably focusing on the Basic Needs sub-theory (Deci & Ryan, 2000). The Basic Needs Theory suggests that in order for an individual to be psychologically healthy, the individual must have all three basic needs of autonomy, competence and relatedness, satisfied. Ryan and Deci (2000) found that when playing conditions created by the coach reliably supported autonomy and competence, intrinsic motivation was encouraged, whereas when the coach used controlling behaviors, intrinsic motivation was hindered. This study suggests that the playing conditions created by a coach can have a direct effect on the psychological processes of an athlete.

Amorose and Anderson-Butcher (2015) delivered a series of questionnaires to 14-18-year-old student-athletes in order to examine how coaching behaviors were related to motivation, need satisfaction, and burnout. Results revealed that autonomy-supportive coaching (ASC) was significantly correlated to adaptive motivational responses, such as increased feelings of autonomy, competence and relatedness. Controlling coaching (CC) behaviors were significantly related to maladaptive outcomes, such as burnout and amotivation. According to the Motivational Model of Coach-Athlete Relationships (Mageau & Vallerand, 2003), ASC behaviors include providing athletes with a choice within specific rules and limits, providing a rationale for task and limits, acknowledging the athlete's feelings, providing non-controlling

feedback, avoiding controlling behaviors, and preventing ego-involvement in athletes.

Controlling coaching, on the other hand, includes behaviors such as using external rewards,

using controlling feedback, displaying excessive personal control, utilizing intimidation,

promoting ego-involvement, and using conditional regard, (Bartholomew, Ntoumanis, &

Thogersen-Ntoumani, 2009). When a coach uses ASC techniques, his or her athletes are more

likely to have their basic needs satisfied, as specified in the Self-Determination Theory (Deci &

Ryan, 2000). Conversely, if a coach uses controlling coaching techniques, his or her athletes are

more likely to lose motivation and/or burn out.

  In addition to motivation, Self-Determination Theory has been used to examine coaching

behavior during athletes' process of returning to play following an injury. Podlog and Dionigi

(2010) interviewed coaches regarding their perceptions of the main challenges athletes faced

during the rehabilitation process as well as the strategies that they used to help the athletes

overcome these perceived challenges. High performance coaches from a variety of sports

(including field hockey, rowing and water polo) at the senior international and/or junior national

competition levels were questioned using a semi-structured interview approach. These coaches

had a mean of 14.13 years' experience and had worked with an athlete returning from an injury.

Podlog and Dionigi (2010) examined the extent to which the coach's strategies used throughout

the rehabilitation process satisfied the three basic needs of the injured athletes, as outlined in

Self-Determination Theory (Deci & Ryan, 2000). Results revealed that strategies such as

coordinating a collaborative team approach to rehabilitation, goal setting, and the use of role

models, facilitated the fulfillment of the three basic needs. Furthermore, results indicated that the

behaviors displayed by coaches allowed the rehabilitation process to be monitored and gradually

progressed, providing the athlete social support throughout the process. These results indicate

that the environment created by the coach's specific behaviors was able to satisfy athletes' basic needs which, from the coach's perspective, facilitated the process of returning to play following an injury.

In addition to Self-Determination Theory, research examining athletic injury has analyzed the effects of perceived stress. Anderson and Williams (1988) created a stress-injury model to help explain potential factors of stress as related to the onset of injuries. Such factors include personality (e.g. hardiness and locus of control), history of stressors (e.g. daily hassles and previous injury), and coping responses (e.g. social support system and mental skills). As such, it has been posited that high levels of perceived negative life-event stress are positively correlated to the onset of injuries (Anderson & Williams, 1988).

According to Woodman and Hardy (2001), organizational stress in sport is defined as the interaction between the athlete and their sport as an institute in which they participate. Woodman and Hardy (2001) used a semi-structured interview to examine coaching behaviors and the relationship to the stress of athletes. Woodman and Hardy (2001) conducted semi-structured interviews with current or recently retired (within four years) elite athletes from a national team about their perceptions of organizational stress. Analysis of these interviews reveled that problems with leadership, including the coach and his or her coaching style, contributed to organizational stress. Some of the more persistent problems described by athletes included non-supportive coaching attitudes, coach's differential treatment of athletes, and coach-athlete tension. The behaviors identified by Woodman and Hardy (2001) are consistent with Bartholomew, Ntoumanis, and Thogersen-Ntoumani's (2009) taxonomy of CC behaviors. Taken together, this suggests that CC is related to an increase in negative stress for athletes.

Additional research examining stress and injury has produced similar findings (see Johnson & Ivarsson, 2011; Petrie, 1992; Steffen, Pensgaard & Bahr, 2009). For example, Johnson and Ivarsson (2011) tested four hypotheses regarding personality characteristics and injury risk, the relationship between perceived life stress and injury occurrence, coping behaviors and injury risk, and finally, the specific psychological factors associated with injury risk. One hundred and eight 17 to 19-year-old high school soccer players completed a series of questionnaires during a five-month period while athletic trainers continuously recorded the number of injuries and the amount of time missed due to the injury for each athlete. Results indicated that negative life event stresses, somatic trait anxiety, negative coping and mistrust were all significant predictors of injury. It was suggested that one coping strategy that was particularly important to the athletes was the presence of a role model, potentially their coach. These results further solidify the notion that a coach has a direct impact on the sport environment. As a product, athletes' psychological processes may be related to the onset, or worsening, of an injury (Podlog & Dionigi, 2010; Woodman & Hardy, 2001).

Taken together the results of previous research suggest that specific coaching behaviors play a role in: (a) whether an athlete's basic psychological needs are satisfied; (b) an athlete's motivational type; (c) perceived life stress; (d) the psychological aspects associated with returning from an injury. However, what remains unclear is the extent to which coaching behaviors influence the onset of athlete injury. It is predicted that if a coach uses CC behaviors, such as intimidation, the athlete may feel pressure to continue to play through a minor injury, causing further damage. In contrast, coaching behaviors that satisfy an athlete's need for autonomy, may influence the athlete's willingness to take the necessary time off to fully recover. As such, the current study sought to examine the relationship between athlete's perceptions of

their coach's behaviors, specifically autonomy-supportive coaching and controlling coaching behaviors, and athletic injury. The present study used Fuller, Ekstrand, Junge, Anderson, Bahr, and Dvorak's (2006) definition of an injury as "any physical complaint that results from a [sport] match or [sport] training," (p. 84), and injury severity as the number of days between the onset of the injury and the player's full return.

Methods

Participants

One hundred NCAA Division I athletes (males, n = 34, females, n=60; mean age of 20.5 years) competing at a mid-sized university in the mid-Atlantic region of the United States were recruited from a variety of sports using purposeful sampling, which "involves studying information-rich cases in depth and detail," (Patton, 1999, p. 1197). In line with IRB protocol, to ensure confidentiality, participants were not asked to identify the sport that they played.

Instruments

Each participant was given a battery of questionnaires, in the form of a single Qualtrics survey to assess the relationship between coaching behaviors and athletic injury. Participants completed the Sport Climate Questionnaire (Amorose & Anderson-Butcher, 2007). This questionnaire contains 15-items, which uses a 7-point Likert scale (ranging from strongly disagree to strongly agree) to examine athletes' perceptions of their head coach's autonomy-supportive coaching behavior. Amorose and Anderson-Butcher (2007) conducted a goodness of fit test on this scale. They found an overall fit that was acceptable ($\chi 2 = 97.17$, d$f = 34$, $p = .00$). To examine controlling coaching behaviors, participants also completed the Controlling Coach Behavior Scale (Bartholomew et al., 2010). This scale is a 15-item questionnaire that uses a 7-point Likert scale (ranging from strongly disagree to strongly agree) to examine the extent to

which athletes feel that their coach is controlling their behavior. Bartholomew et al. conducted measures of goodness of fit on the scale. They found an excellent fit (S-Bχ2 (84) = 144.38, $p <$ .001). Finally, participants were given an adapted version of the Dancer Injury Profile Questionnaire (Rip, Fortin, & Vallerand, 2006) in order to assess their injuries caused by any sport. This questionnaire primarily contains 7-point Likert scale questions, such as "how present is pain in your daily life," as well as questions such as "how many chronic injuries are you currently suffering from, which are persistent problems." Even though this survey is targeted towards dancers, all athletes were able to answer the questions in regards to their sport. This questionnaire allowed participants to reveal as much detail about their injuries as they wished.

Survey Administration

Following Institutional Review Board approval, coaches were contacted through email to obtain permission for the athletes to participate before athletes were contacted. Following coaches' consent, athletes were gathered, by team, in a meeting to complete the survey through a private link on their phone or tablet. Paper and pencil questionnaires were made available and provided to athletes who did not have access to the necessary technology. Coaches were not present for survey administration. Prior to completing the questionnaire, participants were provided with informed consent through the Qualtrics link before being able to move on to the questionnaire. Participation in the study was voluntary and athletes were instructed that they had the option to stop at any point during the study without penalty. If the athlete agreed to continue, he or she continued to the questionnaire through the Qualtrics survey provided. Finally, participants provided basic demographic information (e.g. sex, ethnicity, age, years with current coach, and number of practice days).

Data Analysis

Once data were collected, correlation and multiple regression analyses were conducted

using the SPSS (version 21.0) statistical package. To ensure confidentiality, all responses were

recorded on a Qualtrics survey with no names or numbers linking participants to responses. All

responses were kept on a password protected computer and were only be accessible by the

primary researcher and advisor.

Results

The purpose of this study was to examine the relationship between coaching behaviors

and athletic injury. To establish if relationships exist, correlational analyses were conducted,

followed by multiple regression analysis to predict aspects of an athletic injury from perceived

coaching behaviors. For each equation, a simultaneous entry method was used. The present

studies used the following parameters to determine the strength of the correlations: (a) ±1.0 to

±0.5 as strong; (b) ±0.5 to ±0.3 as moderate; (c) +0.1 to -0.1 as weak. Correlations revealed that

controlling coaching and autonomy-supportive coaching behaviors were negatively correlated to

one another, ($r(82) = -.630, p < .001$). All correlations for CC and ASC are shown in Appendix

A.

Controlling coaching was significantly correlated to the presence of pain, ($r(95) = .257, p$

$= .012$), while ASC was not significant, ($r(82) = -.168, p = .129$). Neither CC nor ASC were

significantly correlated to the number of injuries or the length of time athletes suffered from their

injuries.

Controlling coaching was significantly correlated to several perceived causes of injuries

including long working hours outside of scheduled hours ($r = .472, p = .006$), working under

stressful conditions ($r = .358, p = .041$), insufficient warm-up ($r = .379, p = .030$), insufficient

recovery ($r = .474$, $p = .005$), and inadequate nourishment ($r = .358$, $p = .041$). Autonomy-supportive coaching was not significantly correlated to any perceived causes of injury.

Coaching behaviors were significantly correlated to athletes' response to pain. Controlling coaching was significantly correlated to athletes discussing their injury with their coach ($r = -.374$, $p < .001$), to athletes discussing their injury with a friend ($r = -.232$, $p = .026$), and to athletes ignoring the pain ($r = .211$, $p = .043$). Autonomy-supportive coaching was significantly, and positively, correlated to athletes consulting a doctor ($r = .268$, $p = .016$), athletes discussing their injury with their coach ($r = .497$, $p < .001$), athletes discussing their injury with a friend ($r = .262$, $p = .018$), and athletes stopping and resting ($r = .222$, $p = .046$). Overall, coaching behaviors significantly predicted if athletes would discuss their injury with their coach, $F (2, 77) = 13.239$, $p < .001$, $R^2 = .256$. Coaching behaviors were able to account for 25.6% of the variance. Of the predictors, perceiving one's coach as ASC was significant ($\beta = .414$, $t (77) = 3.306$, $p = .001$), while perceiving one's coach as CC was not significant ($\beta = -.132$, $t (77) = -1.054$, $p = .295$).

Coaching behaviors were significantly related to who would influence athletes' return to sport. Controlling coaching was significantly, and negatively, correlated to their coach influencing their return ($r = -.347$, $p = .001$) and to oneself influencing their return ($r = -.385$, $p < .001$). Autonomy-supportive coaching was significantly, and positively, correlated to their coach influencing their return ($r = .422$, $p < .001$), themselves influencing their return ($r = .410$, $p < .001$), and their family influencing their return ($r = .221$, $p = .046$). Overall, coaching behaviors were significant in predicting if a coach would influence an athlete's decision to return to his or her sport following an injury, $F (2, 78) = 8.785$, $p < .001$, $R^2 = .184$. This indicates that coaching behaviors were able to account for 18.4% of the variance among the data. Of the

predictors, perceiving one's coach to use ASC was significant ($\beta = .341$, $t(78) = 2.624$, $p = .010$), while perceiving one's coach to use CC was not significant ($\beta = -.124$, $t(78) = -.952$, $p = .344$). Coaching behaviors were also significant in predicting if the athlete, themselves, would influence their own return, $F(2, 78) = 9.443$, $p < .001$, $R^2 = .195$. Coaching behaviors account for 19.5% of the variance among the data. Of the predictors, perceiving one's coach to use ASC was significant ($\beta = .270$, $t(78) = 2.090$, $p = .040$), while perceiving one's coach to use CC was not significant ($\beta = -.221$, $t(78) = -1.708$, $p = .092$).

Finally, coaching behaviors also were significantly related to the extent to which athletes took measures to prevent injury on their own. Controlling coaching was negatively correlated ($r = -.218$, $p = .035$), while ASC was positively correlated ($r = .250$, $p = .022$). Overall, coaching behaviors were minimally significant in predicting the extent to which an athlete took measures to prevent injury on their own, $F(2, 79) = 3.891$, $p = .024$, $R^2 = .090$. Coaching behaviors account for 9% of the variance. Although the equation was significant overall, of the predictors, neither perceiving one's coach to use ASC ($\beta = .116$, $t(79) = .844$, $p = .401$) nor perceiving one's coach to use CC ($\beta = -.213$, $t(79) = -1.554$, $p = .124$) were significant.

Discussion

The present study sought to expand on past research by examining the relationship between coaching behaviors, specifically controlling coaching and autonomy-supportive coaching, and athletic injury. Research has shown that coaching behaviors are related to the satisfaction of athletes' basic needs as specified in the Self-Determination Theory (Ryan & Deci, 2000). This research identified the connection between the specific behaviors performed by the coach and if an athlete feels autonomous and related. Podlog and Dionigi (2010) expanded on this to show that coaches perceive the satisfaction of those three basic needs as an important

factor in athletes' return from injury. Considering these findings, the present study hoped to reveal a connection between specific coaching behaviors and athletic injury. Additionally, research has revealed that coaching behaviors are related to stress (Woodman & Hardy, 2001), and that stress is related to athletic injury (Johnson & Ivarsson, 2011). While stress may serve as a mediating factor, the present study sought to reveal the direct connection between the coaching behaviors and athletic injury.

A significant correlation for CC and the presence of pain was revealed. However, it is not possible to suggest that CC behaviors are the cause of such pain inducing injuries. As an injured athlete is unlikely to be able to perform at their best, a coach's role is to help athletes develop, and to protect them if possible, from injury. Since a relationship exists between CC and the presence of pain, coaches may consider avoiding CC behaviors because they are related to the increased likelihood of pain presence.

With respect to perceived causes of injuries, CC was positively correlated, with moderate strength, to several perceived causes of injury including: long working hours outside of scheduled athletic contact hours, working under stressful conditions, insufficient warm-up and recovery, and inadequate nourishment. These results indicate that as athletes' perceptions of their coach's use of CC behaviors increase, the perceptions of these factors as the cause of injury also increase. While it cannot be stated that a direct causal relationship exists between coaching behaviors and injury, such results suggest that CC behaviors are related to athletes' perceptions of the cause of their injury.

Podlog and Dionigi (2010) showed that the environment that the coach creates through their coaching behaviors can influence the satisfaction of an athlete's basic needs, as defined by the Self-Determination Theory (autonomy, competency, and relatedness), and influence an

athlete's return from injury. The present study focused specifically on the autonomy component. Results of the present study discovered a relationship between coaching behaviors and whether an athlete would discuss his or her injury with his or her coach. Controlling coaching was negatively correlated to an athlete discussing his or her injury with his or her coach, while ASC was positively correlated. As such, this finding reliably predicts that if an athlete perceives their coach to display ASC behaviors, they will likely discuss their injury with their coach. This finding is an important consideration because coaches serve as an important asset in the facilitation of athletes' return to play including, but not limited to, helping the athlete seek proper medical treatment. Conversely, if an athlete does not approach their coach due to his or her use of CC behaviors, the coach is unable to provide this assistance in the process of returning to play.

Finally, coaching behaviors were related to athletes' return to play in his or her sport, specifically who has influence during this process. Controlling coaching was negatively correlated with his or her coach and to his or herself influencing his or her return to sport. Autonomy-supportive coaching, on the other hand, was positively correlated with his or her coach and his or herself influencing his or her return to sport. Overall, coaching behaviors were significant in predicting both of these influences. It was predicted that ASC could influence the willingness of the athlete to take the necessary time off, while CC could influence the athlete to continue to play through an injury. These findings indicate that how an athlete perceives their coach impacts whether their coach and the athlete themselves influence their return to sport following a period of absence due to an injury. If athletes perceive their coach to use ASC, it is more likely that their coach will influence the athlete's return to sport by allowing the coach to encourage the athlete to take the necessary time off. If an athlete perceives their coach to exhibit

CC behaviors, they are less likely to discuss the injury with their coach thus removing the possibility of the coach influencing their return to play.

While this study established the existence of a relationship between coaching behaviors and various aspects of athletic injury, it failed to provide explicit causation for such. This study was limited in the following ways. Purposeful sampling was used to gather participants for data collection. Although a large sample size was obtained (n = 100), a larger proportion of female participants completed the questionnaire compared to male participants. As such the experience of male participants may not have been represented fully in the result of data analysis. This limited diversity within the sample may have resulted in limited external validity. A more diverse sample, including a greater number of male participants, and a larger reach (i.e. including a greater number of institutions) may have produced a better representation of the general athletic population. Another limitation was the inability to gather information about which sports were represented in the study. This limited the study in that it was unable to determine if a relationship exist across or within sports, specifically if athletes of a particular sport are more likely to perceive their coach to be more controlling or autonomy-supportive, as well as if athletes of a particular sport are more likely to face injuries. In addition, while it is assumed that participants provide accurate and truthful information, as they completed the questionnaire of their own volition, as with the majority of research of this nature, it is not guaranteed that these were in fact absolute accurate representations of their experiences.

Recommendations for further research are to broaden the study by examining multiple institutions and by using a case study method. A case study method would allow a researcher to examine the exact causes of an injury, specifically if and why the coaching behaviors caused the injury. It is still unknown why this relationship exists, if there is a trend among sports and if

specific coaching behaviors cause such injuries. Answering these questions would allow

researchers to advise coaches on how to behave to best protect their athlete from injury. It could

be stated that specific behaviors do seem to cause injury, thus allowing coaches and athletes to

better identify risky behaviors would be of interest to future research. Future studies should

explore if a trend exists among particular sports, while increasing the external validity of the

present study, by including participants from multiple institutions.

Past research (e.g., Amorose & Anderson-Butcher, 2015; Mageau & Vallerand, 2003;

Ryan & Deci, 2000) has established the importance of ASC. The findings in this study have

elaborated on the importance of using ASC over CC by establishing that a relationship exists

between coaching behaviors and athletic injury. Specifically, CC was positively correlated to the

presence of pain and certain perceived causes of injury, as well as negatively correlated with an

athlete discussing their injury with their coach and the coach being an influence in athletes'

return to their sport. Autonomy-supportive coaching was shown to be positively correlated to

athletes discussing their injury with their coach and one's coach being an influence in their return

to their sport. As such it is recommended that coaches use ASC behaviors in order to enhance the

psychological and psychical well-being of their athletes.

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Appendix A – Correlations

		Controlling Coaching	Autonomy-Supportive Coaching
Controlling Coaching	Pearson Correlation	1	-.630**
	Sig. (2-tailed)		0
	N	98	83
Autonomy-Supportive Coaching	Pearson Correlation	-.630**	1
	Sig. (2-tailed)	0	
	N	83	84
How present is pain in your daily life?	Pearson Correlation	.257*	-0.168
	Sig. (2-tailed)	0.012	0.129
	N	96	83
Did you cut back on playing?	Pearson Correlation	-0.023	0.187
	Sig. (2-tailed)	0.898	0.332
	N	33	29
What should you have done (concerning your sport-related activities)?	Pearson Correlation	0.07	0.221
	Sig. (2-tailed)	0.699	0.25
	N	33	29
To which extent did these injuries affect your sport?	Pearson Correlation	0.004	0.052
	Sig. (2-tailed)	0.985	0.791
	N	32	28
Cause: Cumulative fatigue	Pearson Correlation	0.037	0.159
	Sig. (2-tailed)	0.836	0.409
	N	33	29
Cause: Overwork	Pearson Correlation	-0.012	-0.016
	Sig. (2-tailed)	0.945	0.933
	N	33	29
Cause: Prior repetitive injury	Pearson Correlation	0.076	-0.074
	Sig. (2-tailed)	0.675	0.705
	N	33	29
Cause: Wrong movement	Pearson Correlation	-0.066	0.023
	Sig. (2-tailed)	0.713	0.907
	N	33	29
Cause: Practice/training drills which are too dangerous	Pearson Correlation	0.239	-0.007
	Sig. (2-tailed)	0.18	0.97
	N	33	29
Cause: Pursuit of activities in spite of repeated pain	Pearson Correlation	0.088	-0.069
	Sig. (2-tailed)	0.627	0.722
	N	33	29
Cause: Repetitive movement	Pearson Correlation	0.146	0.015
	Sig. (2-tailed)	0.418	0.939
	N	33	29
Cause: Inappropriate technique-training	Pearson Correlation	0.216	0.012
	Sig. (2-tailed)	0.227	0.951
	N	33	29

Cause: Inadequate maintenance of the facility and or playing surface	Pearson Correlation	0.239	0.057	Other (please specify)	Pearson Correlation	-0.1	0.029
	Sig. (2-tailed)	0.18	0.768		Sig. (2-tailed)	0.712	0.926
	N	33	29		N	16	13
Cause: Long working hours outside of scheduled hours	Pearson Correlation	.472**	-0.027	You consult a doctor, an osteopath, a physiotherapist, etc.	Pearson Correlation	-0.136	.268*
	Sig. (2-tailed)	0.006	0.888		Sig. (2-tailed)	0.195	0.016
	N	33	29		N	92	81
Cause: Working under stressful conditions	Pearson Correlation	.358*	-0.324	You discuss it with your coach	Pearson Correlation	-.374**	.497**
	Sig. (2-tailed)	0.041	0.086		Sig. (2-tailed)	0	0
	N	33	29		N	92	81
Cause: Insufficient warm-up	Pearson Correlation	.379*	-0.076	You discuss it with a friend	Pearson Correlation	-.232*	.262*
	Sig. (2-tailed)	0.03	0.696		Sig. (2-tailed)	0.026	0.018
	N	33	29		N	92	81
Cause: Insufficient recovery (stretching following the work session)	Pearson Correlation	.474**	0.115	You stop and rest	Pearson Correlation	-0.156	.222*
	Sig. (2-tailed)	0.005	0.553		Sig. (2-tailed)	0.136	0.046
	N	33	29		N	92	81
Cause: Inadequate nourishment	Pearson Correlation	.358*	-0.3	You take non-prescription medication (analgesics, anti-inflammatory, …)	Pearson Correlation	-0.134	0.185
	Sig. (2-tailed)	0.041	0.114		Sig. (2-tailed)	0.203	0.099
	N	33	29		N	92	81
Cause: Dehydration	Pearson Correlation	0.309	-0.17	You keep playing but cautiously	Pearson Correlation	0.012	0.047
	Sig. (2-tailed)	0.08	0.378		Sig. (2-tailed)	0.907	0.678
	N	33	29		N	92	81
Cause: Equipment failure	Pearson Correlation	0.237	-0.21	You ignore the pain	Pearson Correlation	.211*	-0.096
	Sig. (2-tailed)	0.183	0.274				
	N	33	29				

	Sig. (2-tailed)	0.043	0.396	Influence return: Athletic trainer	Pearson Correlation	-0.157	0.185
	N	92	81		Sig. (2-tailed)	0.135	0.098
You hide the pain from others	Pearson Correlation	0.129	0.017		N	92	81
	Sig. (2-tailed)	0.219	0.879	Influence return: Your coach	Pearson Correlation	-.347**	.422**
	N	92	81		Sig. (2-tailed)	0.001	0
A lack of money prevented me from seeking proper treatment.	Pearson Correlation	0.135	-.221*		N	93	82
	Sig. (2-tailed)	0.201	0.048	Influence return: Yourself	Pearson Correlation	-.385**	.410**
	N	92	81		Sig. (2-tailed)	0	0
The lack of time prevented me from seeking proper treatment.	Pearson Correlation	0.015	-0.071		N	92	82
	Sig. (2-tailed)	0.887	0.531	Influence return: A teammate who has been in the same situation	Pearson Correlation	-0.163	0.097
	N	92	81		Sig. (2-tailed)	0.118	0.385
My personal pride (not wanting others to know that I'm injured).	Pearson Correlation	-0.091	0.011		N	93	82
	Sig. (2-tailed)	0.387	0.922	Influence return: Family members	Pearson Correlation	-0.111	.221*
	N	92	81		Sig. (2-tailed)	0.289	0.046
In general, at what point do you research information about your injury and its treatment?	Pearson Correlation	-0.025	0.173		N	93	82
	Sig. (2-tailed)	0.811	0.123	To which extent do you take measures to prevent injury on your own (things which are not required of you) to reduce the risk of sport-related injuries and improve your health?	Pearson Correlation	-.218*	.250*
	N	92	81		Sig. (2-tailed)	0.035	0.022
Influence return: Your healthcare provider (physician, physiotherapist, etc.)	Pearson Correlation	-0.131	0.204				
	Sig. (2-tailed)	0.209	0.066				
	N	93	82		N	94	83

Number of chronic injuries	Pearson Correlation	0.113	.001
	Sig. (2-tailed)	0.267	0.995
	N	98	84
How long have you been suffering from this or theses chronic injury(ies)?	Pearson Correlation	0.138	-0.084
	Sig. (2-tailed)	0.176	0.447
	N	98	84
Number of acute injuries	Pearson Correlation	0.167	-0.039
	Sig. (2-tailed)	0.176	0.728
	N	98	84
How long have you been suffering from this or theses acute injury(ies)?	Pearson Correlation	0.168	-0.154
	Sig. (2-tailed)	0.099	0.162
	N	98	84
Number of injuries	Pearson Correlation	0.165	-0.066
	Sig. (2-tailed)	0.104	0.550
	N	98	84

Appendix B - Informed Consent

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Olivia Kimmel and Dr. Greg Young of James Madison University. The purpose of this study is to determine if a relationship exists between coaching behaviors and athletic injuries. This study will contribute to the researcher's completion of her senior thesis.

Research Procedures

This study consists of a survey that will be administered to individual participants in a convenient location to be determined by your coach. You will be asked to provide answers to a series of questions related to your past and present athletic injury, and your perceptions of coaching behaviors.

Time Required

Participation in this study will require no more than 20 minutes of your time.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

Potential benefits from participation in this study include the provision of potential insight into factors that can contribute to athletic injury. While this is not a direct benefit to the participants, this study will serve as a prospective educational tool for coaches with the possibility to lead to behavior change among coaches, in order to better serve their athletes.

Confidentiality

The results of this research will be presented at the honors symposium. While individual responses are obtained and recorded anonymously and kept in the strictest confidence, aggregate data will be presented representing averages or generalizations about the responses as a whole. No identifiable information will be collected from the participant and no identifiable responses will be presented in the final form of this study. All data will be stored in a secure location accessible only to the researcher. The researcher retains the right to use and publish non-identifiable data. At the end of the study, all records will be destroyed.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind. However, once your responses have been submitted and anonymously recorded you will not be able to withdraw from the study.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Olivia Kimmel   Dr. Greg Young
Psychology   Kinesiology
James Madison University   James Madison University
kimmelol@dukes.jmu.edu   Telephone: (540) 568-4363
                                       younggx@jmu.edu

Questions about Your Rights as a Research Subject
Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this cover letter and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. I certify that I am at least 18 years of age.

Yes, I do consent   ☐

No, I do not   ☐   consent

Appendix C - Questionnaire

Controlling Coaching Scale

This questionnaire contains items that are related to your experience with your coach (trainer). Coaches have different styles in dealing with athletes, and we would like to know more about how you have felt about your encounters with your coach. Your responses are confidential. Please be honest and candid.

Please indicate how much you agree or disagree with each statement:	Strongly Disagree						Strongly Agree
My coach is less friendly with me if I don't make the effort to see things his/her way.	1	2	3	4	5	6	7
My coach shouts at me in front of others to make me do certain things.	1	2	3	4	5	6	7
My coach only uses rewards/praise so that I stay focused on tasks during training.	1	2	3	4	5	6	7
My coach is less supportive of me when I am not training and competing well.	1	2	3	4	5	6	7
My coach tries to control what I do during my free time.	1	2	3	4	5	6	7
My coach threatens to punish me to keep me in line during training.	1	2	3	4	5	6	7
My coach tries to motivate me by promising to reward me if I do well.	1	2	3	4	5	6	7
My coach pays me less attention if I have displeased him/her.	1	2	3	4	5	6	7
My coach intimidates me into doing the things that he/she wants me to do.	1	2	3	4	5	6	7
My coach tries to interfere in aspects of my life outside of my sport.	1	2	3	4	5	6	7
My coach only uses rewards/praise so that I complete all the tasks he/she sets during training.	1	2	3	4	5	6	7
My coach is less accepting of me if I have disappointed him/her.	1	2	3	4	5	6	7
My coach embarrasses me in front of others if I do not do the things he/she wants me to do.	1	2	3	4	5	6	7
My coach only uses rewards/praise to make me train harder.	1	2	3	4	5	6	7
My coach expects my whole life to center on my sport participation.	1	2	3	4	5	6	7

Sport Climate Questionnaire

This questionnaire contains items that are related to your experience with your coach (trainer). Coaches have different styles in dealing with athletes, and we would like to know more about how you have felt about your encounters with your coach. Your responses are confidential. Please be honest and candid.

Please indicate how much you agree or disagree with each statement:	Strongly Disagree						Strongly Agree
I feel that my coach provides me choices and options.	1	2	3	4	5	6	7
I feel understood by my coach.	1	2	3	4	5	6	7
I am able to be open with my coach while engaged in athletics.	1	2	3	4	5	6	7
My coach conveyed confidence in my ability to do well at athletics.	1	2	3	4	5	6	7
I feel that my coach accepts me.	1	2	3	4	5	6	7
My coach made sure I really understood the goals of my athletic involvement and what I need to do.	1	2	3	4	5	6	7
My coach encouraged me to ask questions.	1	2	3	4	5	6	7
I feel a lot of trust in my coach.	1	2	3	4	5	6	7
My coach answers my questions fully and carefully.	1	2	3	4	5	6	7
My coach listens to how I would like to do things.	1	2	3	4	5	6	7
My coach handles people's emotions very well.	1	2	3	4	5	6	7
I feel that my coach cares about me as a person.	1	2	3	4	5	6	7
I don't feel very good about the way my coach talks to me.	1	2	3	4	5	6	7
My coach tries to understand how I see things before suggesting a new way to do things.	1	2	3	4	5	6	7
I feel able to share my feelings with my coach.	1	2	3	4	5	6	7

Dancer Injury Profile

1. **During the past 12 months, how many hours per week on average have you spent on the following activities?**

a. Games   on average _____ h/wk

b. Practices   on average _____ h/wk

c. Weight/Conditioning Training   on average _____ h/wk

2. How present is pain in your daily life?

Not present at all 1   2   3   4   5   6   7 constantly present

3. How many chronic injuries are you currently suffering from, which are persistent problems? *A chronic injury is defined as physical harm to any part of your body which interferes with playing a sport for a period of three months or more.*

a. Number of chronic injuries _____ (if none, please indicate "0")

b. How long have you been suffering from this or these chronic injury(ies) ?

(weeks?, months?, years?)

4. How many acute injuries are you currently suffering from (injuries caused by a trauma or accident) which cause persistent problems?

a. Number of acute injuries _____ (if none, please indicate "0")

b. How long have you been suffering from this(these) accident-related injury(ies) ?

(weeks?, months?, years?)

5. Whether chronic or acute, how long have you suffered from injuries serious enough to affect playing your sport <u>during the past 12 months</u>?

a. Number of injuries _____ *(if none please indicate "0" and skip to question 7)*

b. What did you do?

I did not cut back on playing my sport   1   2 3 4 5   6   7 I completely stopped playing my sport

c. What should you have done (concerning your sport-related activities)?

I should have cut back (1   2   3   4   5   6   7) I should have completely stopped
somewhat on playing my sport

d.   How many days have you been in (fill out all relevant lines):

complete stoppage (no movement)	_____ nbr of days
partial stoppage – unable to complete a technique class	_____ nbr of days
partial stoppage – unable to fully participate in practices	_____ nbr of days
partial stoppage – restriction of some movements	_____ nbr of days
partial stoppage – reduction in work hours (sport related)	_____ nbr of days

e. To which extent did these injuries affect your sport?

Not at all 1   2   3   4   5   6   7 To a great extent

6. In your opinion, what caused these injuries? (Consider all injuries which have occurred during the past 12 months. Select as many answers as necessary and indicate their severity.)

	Not a cause of injury	Very slight cause of injury		Fairly important cause of injury			Very important cause of injury
cumulative fatigue	1	2	3	4	5	6	7
Overwork	1	2	3	4	5	6	7
prior repetitive injury	1	2	3	4	5	6	7
wrong movement	1	2	3	4	5	6	7
practice/training drills which are too dangerous	1	2	3	4	5	6	7
pursuit of activities in spite of repeated pain	1	2	3	4	5	6	7
repetitive movement	1	2	3	4	5	6	7

inappropriate technique-training	1	2	3	4	5	6	7
inadequate maintenance of the facility and or playing surface	1	2	3	4	5	6	7
long working hours outside of scheduled hours	1	2	3	4	5	6	7
working under stressful conditions	1	2	3	4	5	6	7
insufficient warm-up	1	2	3	4	5	6	7
insufficient recovery (stretching following the work session)	1	2	3	4	5	6	7
inadequate nourishment	1	2	3	4	5	6	7
dehydration	1	2	3	4	5	6	7
equipment failure	1	2	3	4	5	6	7
others (specify)_____ _____	1	2	3	4	5	6	7

7.   In general, at which point do you do any of the following as you feel <u>severe pain</u>?

	Never	Almost never	Sometimes	Fairly often	Very often	Almost always	Always
You consult a doctor, an osteopath, a physiotherapist, etc.	1	2	3	4	5	6	7
You discuss it with your coach	1	2	3	4	5	6	7
You discuss it with a friend	1	2	3	4	5	6	7
You stop and rest	1	2	3	4	5	6	7
You take non-prescription medication	1	2	3	4	5	6	7

(analgesics, anti-inflammatory, …)							
You keep playing but cautiously	1	2	3	4	5	6	7
You ignore the pain	1	2	3	4	5	6	7
You hide the pain from others	1	2	3	4	5	6	7

8. To what extent have the following factors prevented you from seeking proper treatment?

   a) A lack of money prevented me from seeking proper treatment.
Not at all 1   2   3   4   5   6   7 Yes, entirely

   b) The lack of time prevented me from seeking proper treatment.
               Not at all 1   2   3   4   5   6   7 Yes, entirely

   c) My personal pride (not wanting others to know that I'm injured).
Not at all 1   2   3   4   5   6   7 Yes, entirely

9. In general, at what point do you research information about your injury and its treatment?

I don't research any information 1   2   3   4   5   6   7 I research as much information as possible

10. In general, to which extent does each of the persons listed below influence your decision to return to normal sport activities?

	Not at all	Very little	A little	Moderately	Regularly	A lot	Enormously
Your healthcare provider (physician, physiotherapist, etc.)	1	2	3	4	5	6	7
Athletic trainer	1	2	3	4	5	6	7
Your coach	1	2	3	4	5	6	7
Yourself	1	2	3	4	5	6	7
A teammate who has been in the same situation	1	2	3	4	5	6	7
Family members	1	2	3	4	5	6	7

11. To which extent do you take measures to prevent injury on your own (things which are not required of you) to reduce the risk of sport-related injuries and improve your health?

I only do what is asked of me 1   2   3   4   5   6   7 I do other things
by myself

Demographics

1. What is your sex?

	Male
	Female
	Prefer not to answer

2. What is your ethnicity?

	White
	Black or African American
	American Indian or Alaska Native
	Asian
	Native Hawaiian or Pacific Islander
	Other

3. What is your age?

	18
	19
	20
	21
	22
	23 or older

4. What year in school are you?

	First year
	Sophomore
	Junior
	Senior
	Fifth year

5. How long have you been playing for your coach?

	Less than 1 year
	1-2 years
	2-3 years
	4 or more years