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Performance orientation and injury among military cadets: The mediating role of disinhibition

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Abstract

This study examined the mediating role of disinhibition (sensation seeking) on the positive association between performance goal orientation (achievement motivation) and risk of sustaining injury. Our study comprised 248 cadets from three military academies. In support of our hypotheses, we found a positive relationship between performance goal orientation and risk of sustaining injury and that this relationship was mediated by disinhibition. This finding contributes to the extant achievement goal theory literature by demonstrating a mechanism through which performance orientation relates to the likelihood of sustaining an injury. Theoretical and practical implications and directions for future research are discussed.

Keywords: Achievement goal theory, performance orientation, mastery orientation, sensation seeking, disinhibition, military cadets, military education, military training, injury proneness, injuries

The aim of our study was threefold. A first purpose was to identify possible psychological variables that could predict injury proneness among military cadets undergoing education and training. A second purpose was to examine the exact relationship between key psychological variables on the one hand and risky behavior leading to injuries on the other. In particular, we wanted to identify possible mechanisms through which type of goal orientation (mastery versus performance) relates to increased risk of sustaining injuries. A third purpose was to assess the explanatory power of key psychological variables in relationship to injuries.

The study reported here is part of a larger longitudinal project that examines the life situations of military cadets undergoing training to be officers. The overall goal of the project is to better understand how the cadets progress through a three-year educational period to become well-prepared officers. The project focuses on both positive and negative aspects of the cadets' educational situation and well-being. One of the important negative aspects is the possibility of sustaining injury that may negatively influence training progress and general life quality. The goal of the specific study reported in this article was to better understand which factors led to injuries during the study period. We were especially interested in psychological dispositions that could lead to injuries and thus hamper the training progress. We hypothesized that two factors were especially relevant: type of achievement motivation and sensation seeking. According to achievement goal theory people can be performance-oriented or mastery-oriented; we assumed that performance orientation and a corresponding competitive attitude would increase proneness to injury. This is especially true for people high in performance orientation, since people who are high in performance orientation show more unsportsmanlike play and aggressive behavior (Duda et al., 1991). Moreover, earlier studies show that performance orientation is positively related to acceptance of intentionally injurious acts (Duda et al., 1991). Also, in environments other than

sport, people who are performance-oriented, competitive, and aggressive may display risky behavior and experience unwanted outcomes like injuries.

According to the sensation-seeking theory, people who are high sensation-seekers are more willing to take risks and we, therefore, assumed that they were more likely to sustain injuries of various kinds. Especially high scores on the disinhibition subscale that identifies people who are involved in drinking, gambling, and partying predict they may be likely to sustain injuries due to their relaxed attitudes. Accordingly, through an integration of achievement goal theory and sensation-seeking literature, the purpose of the present study was to investigate whether there is a positive relationship between performance orientation and risk of sustaining injury, as well as whether this relationship is mediated by disinhibition. By so doing, we aim to better understand the specific psychological dispositions that may lead to injuries among military cadets undergoing training.

The Relationship between Performance Orientation and Injury

Achievement goal theory assumes that there are two major ways in which people can judge their competence level. One is called mastery-oriented; the other, performance-oriented. In the mastery-oriented mode, perceived ability is self-referenced and tied to personal improvement, mastery, and exerted effort. In the performance-oriented mode, the perceived ability is other-referenced and entails the demonstration of superiority above others (Duda et al., 2003:417).[i] The two perspectives thus represent two different ways in which cadets in an educational setting may give meaning to their strivings. However, the perspectives may not only influence students in academic settings but also the ways in which they operate during their free

time and thus shape their cognitions, affect, and behavior across a wide variety of settings and situations like driving a car, being involved in sports, using recreational drugs, etc.

Sports research has shown that high mastery orientation is associated with adaptive behaviors such as the selection of optimally challenging activities, persistence, and a belief that success is the result of effort (Tod and Hodge, 2001). A predominant performance orientation, coupled with low perceived ability, is associated with maladaptive behaviors, such as avoidance of challenging activities, reduced persistence, and mastery devaluation (Duda, 1993; Nicholls, 1992; Roberts et al., 1998; Tod and Hodge, 2001). In addition to the study by Duda et al. (1991) revealing unsportsmanlike play, aggressive behavior, and intentionally injurious acts among young basketball players, a study that examined 173 male youth ice hockey players (age range 11–14 years) found that performance orientation was positively related to the approval of aggressive behavior (Dunn & Causgrove Dunn, 1999). On the other hand, mastery orientation was positively related to personal commitment and respect for social conventions, the rules, and the officials (Dunn & Causgrove Dunn, 1999; Tod and Hodge, 2001).

Accordingly, we hypothesize the following:

Hypothesis 1: There is a positive relationship between performance orientation and injury.

The Mediating Role of Disinhibition

Relatively few studies have focused on the psychological aspects influencing injury-proneness. In an overview of intrinsic personality-related factors that influence injury-proneness, Taimela et al. (1990) pointed to a study of American football players that showed that athletes who were outgoing, as opposed to reserved, and tough-minded, as opposed to tender-minded,

were more likely to sustain injuries. Similarly, football players with a strong internal locus of control sustained fewer injuries than others. A German study of 1138 young national squad members, age 14–18, representing all Olympic sports, found that specific personality traits were correlated with higher willingness to take physical risks and thus be exposed to injuries (Schnell et al., 2014). The study concluded that athletes who were extremely willing to take physical risks attached high importance to their sports environment and minor importance to their non-sports environment. Athletes who were perfectionists and very focused on their performance were particularly willing to accept physical and social risks (Schnell, 2014:165). The authors hypothesized that young athletes accept a "culture of risk" in which they are willing to experience pain, sustain injuries, and jeopardize their long-term health in order to reach their athletic goals. One could similarly hypothesize that military cadets live in a culture of risk, even if it is somewhat different. First, military cadets have to display and develop physical and mental skills of an athletic type both when entering the military academy and during training. Second, the cadets are preparing for an unknown future with potential engagement in military conflicts of a risky nature.

It seems that a possible culture of risk among military cadets could lead to higher levels of injury proneness among those who are most willing to take risks. We therefore used Zuckerman's sensation-seeking theory (Zuckerman,1979:1994) to explore a possible association between risk-taking and injuries. Zuckerman's theory sees risk-taking as a consequence of high sensation-seeking needs. According to this theory, "Sensation seeking is a trait defined by the seeking of varied, novel, complex, and intense situations and experiences, and the willingness to take physical, social, and financial risks for the sake of such experience" (Zuckerman, 1994:27).

Sensation seeking is a need that can be displayed in various ways and on many arenas. The construct includes four subfactors that are moderately correlated. Thrill- and adventure-seeking indicates a desire to engage in risky and adventurous activities and sports, like parachute jumping, climbing, scuba diving, skiing, and sailing. Experience Seeking (ES) represents the seeking of stimulation through the mind and the senses through music, art, travel, psychedelic drugs, and the wish to meet with unconventional people. Disinhibition (Dis) represents sensation seeking through drinking, partying, gambling, and sexual variety. Boredom Susceptibility (BS) represents an aversion to repetitions, whether in work or with persons, and restlessness and boredom when such constancy is unavoidable.

In the general population sensation seeking scores follow a normal distribution pattern (Zuckerman, 2007:7-12). Most military and paramilitary vocations show elevated scores on sensation seeking and thus high sensation seekers are overrepresented in many military groups, with high scores especially on thrill and adventure seeking and disinhibition (Zuckerman 2007:102-103). Even if military cadets show elevated scores on sensation seeking, they are not a homogenous group but show variations in sensation seeking needs. Since high sensation-seekers take higher risks than other people, we expect the high sensation-seeking cadets to be more willing to take risks and thus to be more accident-prone. When growing up, high sensation-seekers engage in many different types of sports, especially challenging ones. They are, therefore, overrepresented in high-risk sports, defined as sports with a serious possibility of severe injury or death (Breivik, 1999). There are several reasons why high sensation-seekers are risk takers. According to several studies high sensation-seekers experience the world as less threatening or dangerous than other people do (Zuckerman, 1994:124–135). Risk appraisal and danger estimations are negatively correlated with sensation seeking (Zuckerman, 1994:126).

Furthermore, in situations with alternative risk levels, high sensation-seekers accept higher risks than others to reach their goals. In gambling situations, for instance, they go for higher rewards at lower stakes. They experience less fear and more positive sensations in situations that are unfamiliar or risky. High sensation-seekers, therefore, are typically more willing to volunteer for experiments that feature challenging, unusual, and unfamiliar situation (Zuckerman, 1994:135). They prefer higher driving speeds than others, are involved in more driving accidents, and typically receive more convictions for driving offenses than other people (Zuckerman, 1994:138–142). Also, in areas like smoking, drinking, substance abuse, and sexual behavior, high sensation-seekers exhibit more experimental, liberal, and risky approaches (Zuckerman, 2007:107).

Since high sensation-seekers are more willing to take risks, they may also be more injury-prone. But skill may, in some cases, play a mediating role. Conolly (1981) compared experienced skiers, ski instructors, and nonskiers and found that ski instructors scored highest on sensation seeking, followed by skiers and nonskiers. This confirms that skiing is an attractive sport, and ski instructor an attractive vocation, for high sensation-seekers. Due to a lot of practice and high skill levels, ski instructors are, however, not more injury-prone than skiers are. The importance of skill level was also confirmed in a study by Bouter, Knipsfeld, Feji, and Volovics (1988) that compared injured and non-injured skiers. Both groups were higher in sensation seeking than the general population, and the injured group was lower than the non-injured group. The TAS subscale accounted for the difference. More thrill- and adventure-seeking may lead to more practice and thus higher skill levels, which may have helped the high sensation-seekers to avoid accidents. In a review of studies of injury and risk-taking behavior, the authors concluded that: “Overall the review found that risk-taking behavior, however it is measured, is associated

with an increased chance of sustaining an injury except in the case of high skilled, risk-taking sports where the effect may be in the other direction" (Turner et al., 2004:93). We assume that a similar logic is operative in relation to potential risky military training forms and sport practices among cadets. For a given task a higher skill level may reduce chances of injury. However, with increasing skill levels more difficult tasks are often undertaken with increased chances of injury.

Not only skill level, but also other unknown factors, may contribute to mixed results about the relation between sensation seeking and injuries. For example, in a study by Landeweerd, Urlings, & DeJong (1990) of Dutch construction workers on the job, sensation seeking was not positively related to injuries. Similarly, sensation seeking was not a predictor of athletic injuries among school athletes at an American university (Smith, Ptacek, & Smoll, 1992).

Other findings confirm a strong relationship in various areas between sensation seeking and risk behavior. In a Danish study of 363 males and 328 females with a mean age of 31.7 years, the investigators found several behavioral characteristics related to sensation seeking (Ripa et al., 2001:1379). Thrill- and adventure-seeking showed a positive correlation with speeding. Disinhibition and Experience seeking correlated stronger than the other subscales with use of alcohol and cannabis and also other drugs. Disinhibition correlated positively with using public transportation without ticket and drunk driving.

Earlier research thus indicates that, whereas Thrill- and adventure-seeking typically relates to goal-directed physical activities like risk sports and risky vocations, Disinhibition and Boredom susceptibility relate more strongly to impulsive social and recreational activities including drinking, partying, and driving. We assume that military cadets who score high on disinhibition are thus more likely to sustain injuries of various kinds.

Accordingly, we hypothesize secondly:

Hypothesis 2: The positive relationship between performance orientation and injury is mediated by disinhibition.

Insert Figure 1 about here

Method

Participants and Procedure

Data for this study was collected from cadets in three Norwegian military academies at two points in time between 2008 and 2009. Time 1 data was collected at the end of the participants' first year at the academy. Time 2 data was collected at the end of the second year. For each measurement occasion, participants filled out a personal code, which we used to match the test data and participant responses on questionnaires for time 1 and 2. The participants were informed that the survey had been approved by the Norwegian Social Science Data Services (NSD) and strict confidentiality was assured. Whereas 248 participants completed the questionnaire during the first measurement, 141 (57%) completed the questionnaire during the second measurement. Accordingly, 107 participants dropped out of the study from T1 to T2. Of these, we know that 37 cadets chose not to participate at T2, and that 35 were on temporary leave for education abroad or quit the program. With respect to the remaining 35 cadets, we believe their lack of participation was more coincidental, with sick leaves and military leaves and passes being the most important causes. At the first measurement occasion (T1), the sample comprised 222 (89.5%) men and 26 (10.5%) women with a mean age of 23.6 years (SD = 2.63). At the

second measurement occasion (T2), the mean age was 24.7 years, and the sample comprised 123 (87.2%) men and 18 (12.8%) women.

Measures

Performance orientation. For the measurement of performance orientation at T1, we used the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998). This scale consists of six items measuring performance orientation and six items measuring mastery orientation. Sample items measuring performance orientation include "I feel most successful when I beat my opponents" and "I feel most successful when I do better than others." Respondents indicated their responses on a five-point scale (1 = totally disagree to 5 = totally agree).

Disinhibition. In order to measure the disinhibition dimension of sensation seeking at T1, we administered the Sensation Seeking Scale V (Zuckerman, 1979), which consists of 40 items in forced-choice format. In addition to measuring Disinhibition, this scale measures Experience seeking, Thrill- and adventure-seeking, and Boredom susceptibility. Sample items measuring Disinhibition include "I like to have new and exciting experiences and sensations, even if they are a little frightening, unconventional, or illegal" and "I like "wild," uninhibited parties."

Injury. Injury was measured at T2. Respondents were asked whether they had sustained an injury the past 12 months (since the date of the first measurement; 0 = no; 1 = yes). At T2, approximately 51% of the respondents reported having sustained an injury since T1.

Control variables. The motivational climate in the training sessions at the academy could influence the cadets' goal orientation and risk of sustaining an injury. We, therefore, controlled for motivational climate using the Perceived Motivational Climate in Sport Questionnaire (PMCSQ; Seifriz, Duda, & Chi, 1992). This scale assesses perceptions of both

performance climate and mastery climate (responses were recorded on a five-point Likert scale). Furthermore, when testing the mediating role of disinhibition, we controlled for experience seeking, thrill- and adventure-seeking, and boredom susceptibility measured at T1 using the Sensation Seeking Scale V (Zuckerman, 1979). In addition, we regarded it as useful to control for mastery orientation at T1 using the Perception of Success Questionnaire (Roberts et al., 1998) since mastery and performance orientation are not orthogonal (e.g., Harwood, Cumming, & Fletcher, 2004). Finally, to rule them out as alternative explanations for the observed findings, we controlled for prior injury at T1 (injury the past 12 months = 1; no injuries the past 12 months = 0), age at T1, and gender (men = 1; women = 2).

Data Analysis

The data was analyzed in several steps. First, in line with De Cuyper, Mäkikangas, Kinnunen, Mauno, and Witte (2012), we conducted a logistic regression analysis to inspect whether dropout (dropout = 1) versus participation at both time periods (participation = 0) was predicted by the Time 1-variables; gender, age, gender injury, performance climate, mastery climate, performance orientation, mastery orientation, thrill- and adventure-seeking, experience seeking, boredom susceptibility, and disinhibition. In this model, dropout was significantly predicted by age ($B = -.13$, $p < .05$, Odds Ratio = .88), and mastery orientation ($B = -.63$, $p < .01$, Odds Ratio = .53). This suggests that, while respondents were less likely to drop out with increasing age and higher levels of mastery orientation, there were no significant differences in the core study variables between those who participated in both time periods and those who dropped out. Second, to test whether the items reflected the construct they were intended to measure, we performed a confirmatory factor analysis (CFA) with the use of the Mplus program. Since binary and ordinal variables “are not continuous and should not be treated as if they are”

(Jöreskog, 2005:10), we used the weighted least squares (WLSMV) estimator (Muthén, du Toit, & Spisic, 1997) to accommodate the binary and ordered categorical data (e.g., Flora & Curran, 2004). Finally, to test whether disinhibition mediates the relationship between performance orientation and injury, we applied the three-step procedure recommended by Baron and Kenny (1986). In the first step, performance orientation should be significantly related to disinhibition. In the second step, performance orientation should be significantly related to injury. In the third and final step, disinhibition should significantly relate to injury; and, if the regression weight for performance orientation is not statistically significant when disinhibition is entered into the equation, then full mediation is present. The analyses were performed using ordinary least squares (Step 1) and logistic regression analyses (Step 2 and Step 3).

Results

The results of an eight-factor CFA model that represented performance orientation, mastery orientation, disinhibition, thrill- and adventure-seeking, boredom susceptibility, experience seeking, performance climate, and mastery climate suggested acceptable fit with the data. Specifically, although the chi square test of exact fit was unsatisfactory (χ^2 [2456] = 3485.83, $p < .001$), the RMSEA test of close fit was well below the desired threshold of .08 (RMSEA = .04; 90% confidence interval: .038 -.044), thus indicated good fit with the data (e.g., Hair, Black, Babin, Anderson, & Tatham, 2006). Furthermore, we tested construct reliability using the composite reliability measure as suggested by Bagozzi and Yi (1988). While composite reliability is analogous to Cronbach's alpha (Nunnally, 1978), it also accounts for the possibility that the items may have different loadings and error variances (Bagozzi & Yi, 1988). The composite reliability estimate should exceed .60 to be satisfactory (e.g. Bagozzi & Yi, 1988). In this respect, the core study variables demonstrated high reliability, with composite reliability

estimates ranging from .73 to .95. Descriptive statistics, bivariate correlations, and reliability estimates are reported in Table 1. As can be seen, performance orientation T1 was positively related to both disinhibition T1 (r = .19, p < .01), and injury T2 (r = .20, p < .05). Furthermore, disinhibition T1 was positively related to injury T2 (r = .22, p < .05).

Insert Table 1 about here

Tables 2 and 3 present the results of the regression analyses. In line with the first step of Baron and Kenny's (1986) three-step procedure, Table 2 demonstrates that performance orientation T1 was positively and significantly related to disinhibition T1 (β = .15, p < .05). As can be seen in Table 3, performance orientation was significantly positively related to injury T2 (B = .42, p < .05, Odds Ratio = 1.52), thus supporting Hypothesis 1, as well as satisfying the second condition of mediation. In the final step, when disinhibition T1 was entered into the equation, the regression weight for performance orientation T1 predicting injury T2 was reduced (from B = .42, p < .05 to B = .31. n.s.). In addition, disinhibition T1 was significantly related to injury T2 (B = .29, p < .05, Odds Ratio = 1.33). The results thus show that disinhibition T1 fully mediates the relationship between performance orientation T1 and injury T2. Accordingly, we obtained support for Hypothesis 2.

Insert Table 2 and Table 3 about here

Discussion

The main purpose of this study was to assess whether there is a relationship between performance orientation and the risk of sustaining an injury and whether this relationship is mediated by disinhibition. The present study holds a number of theoretical implications.

First, with regard to the hypothesized direct relationship, we found that individuals who are more performance oriented have a higher probability of sustaining an injury. This suggests that individuals who prioritize personal interests, and who pursue personal success and superiority over others (Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, 2012), are more likely to sustain an injury. Specifically, our results show that for each one-point increase on the performance orientation scale, the odds of sustaining an injury the subsequent 12 months increase by 1.52. This means that, during the last 12 months, cadets who are high on performance orientation seem to have been more willing to take risks, been careless, or more exposed to situations and environments that increase the likelihood of injury. We do not know exactly which situations and environments, but we know that cadets are involved in both leisure time sports and recreation settings, and in military training of various kinds, and that these are likely arenas for injuries. However, what we do know from achievement goal literature is that persons with high scores on performance orientation have a self-referenced outlook that makes them likely to want to beat others and "show off" in various settings.

Second, with respect to the hypothesized indirect relationship, a key finding of our longitudinal study is demonstrating the mediating role played by disinhibition on the positive relationship between performance orientation and injury. This finding contributes to the extant achievement goal theory literature by demonstrating a mechanism through which performance orientation relates to likelihood of injury. That is, by theoretically relying on disinhibition, our study has extended the use of achievement goal theory by investigating how performance orientation is related to an individual outcome (i.e., personal injury). Earlier studies of the relationship between sensation seeking and injury have showed mixed results since the relation is moderated by skill. High sensation-seekers prefer risky sports (Breivik, 1999). They are thus at

risk of sustaining various types of injuries. But, because of high skill levels developed through a lot of training, they are not necessarily more injured than others. Several studies have found no positive correlation between sensation seeking and injuries in sports (Conolly, 1981; Ditunno and Mccauley, 1985; Bouter et al., 1988). Whereas earlier studies have focused on the Thrill- and adventure-seeking subscale and sport injuries, the present study had a broader focus, not limited to sports settings, and with a focus on the Disinhibition subscale. The Disinhibition subscale generally signals a nonconformist and unconventional lifestyle. We do not know exactly what this lifestyle means in a military setting. It can be related to a casual attitude during the everyday training at the academy. But it can also mean involvement in risky sports or spontaneous risk-taking in everyday settings outside the school system. In any case the context is not limited to sports. Our study thus contributes to the extant sensation-seeking literature by demonstrating a positive relationship between sensation seeking (disinhibition) and injury, even when controlling for achievement motivation. Furthermore, our study shows that a performance-oriented outlook with a focus on competitive comparison with others lead to injuries. The combination of performance orientation and disinhibition may, in many situations, lead to impulsive, un-socialized types of behavior like competitive drinking, partying, speeding, and gambling (Zuckerman, 2007). Some cadets may have been involved in these types of behavior and situations and may thus have experienced an increased prevalence of injuries. But the injuries may also be the result of a strong performance orientation in combination with an impulsive or casual attitude during the everyday military training at the academy. Since we, in this study, do not know the cause of the injury, it will be important in future studies to more precisely identify the type of injury and the cause of the injury. So far we can confirm the

mediation, but can only assume that it is impulsive risk taking in social and recreational settings and/or in professional training that causes the injuries and thus, also, the mediation.

Limitations and Research Directions

Some limitations should be acknowledged when interpreting our significant results.

First, even though we utilized a longitudinal design, our data were correlational, thus prohibiting causal inferences.

Second, the reliance on self-report data with respect to performance orientation's relationships with disinhibition and injury may limit the validity of our findings owing to, for example, the *illusory correlations* or *implicit theories* of the respondents (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, by investigating the variables at different time points, such problems related to the use of self-report data should be lessened (Podsakoff et al., 2003). Furthermore, we undertook additional procedural remedies, such as ensuring the anonymity of the respondents and psychologically separating the scale items for the predictor and the mediating variable (Podsakoff et al., 2003)

Third, the generalizability of the results may be limited by the sample used to test the hypotheses, which consisted of predominantly male cadets from three military academies in Norway. It may be that, in other countries and contexts, a similar study may have produced different results. Beyond conducting similar studies with experimental designs, in other sports contexts and countries, our findings also suggest new avenues for future research.

Fourth, we did not in this study have information on the nature, type, and setting of the injuries. Future studies are needed to get more precise information about causes, context and behavior leading to injuries.

Practical Implications

The findings of this study imply that cadets who are more performance oriented relative to others sustain injuries more often but that this relationship is mediated by disinhibition. Recruitment officers at the military academies, for instance, may draw on our findings and seek to recruit cadets who are less performance oriented or who report low disinhibitory scores. Our suggestion is that if future research can confirm our results and, in addition, can also prove a causal relationship between reckless leisure time behavior (e.g., partying and drinking) and the prevalence of injury, this should, to some extent, affect the recruitment policy. However, if the mediation revealed in this study is not caused by impulsive and unsocial leisure behavior, our results should not affect the recruitment policy in a more restrictive direction. On the other hand, the association between performance orientation, disinhibition and injury may be used to inform ways of supporting individuals to successfully complete training without injury. Our study does not imply that performance orientation and high disinhibition are necessarily negative factors relative to all aspects of military education and a military career and, as suggested by Parmak et al. (2014), one should accept that there is a person-environment fit that makes some personality characteristics beneficial in some settings and suboptimal or negative in other settings. Thus, high sensation-seekers that have problems in an educational, strongly regulated setting may blossom in risky military situations. Thomas A. Thus Kolditz, a professor at West Point, formulates the idea of “in extremis leadership” where leaders who have personality characteristics that are suboptimal under peaceful non-military conditions may become optimal under extreme conditions, like risky military actions (Kolditz, 2007). This may lead to a more

flexible view where different personality characteristics may be optimal depending on type of military situation and type of task. That which is optimal during training and preparation at school may be suboptimal during action in the military theater.

References

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science, 16*(1), 74–94.

Baron, R. M., & Kenny, D. A. (1986). The moderator mediator variable distinction in social psychological-research - conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Bouter, L. M., Knipschild, P. G., Feji, J. A., & Volovics, A. (1988). Sensation seeking and injury risk in downhill skiing. *Personality and Individual differences, 9*, 667–673.

Breivik, G. (ed.). (1999). *Sensation seeking in sport.* Oslo: Norwegian School of Sport Sciences.

Conolly, P. M. (1981). *An exploratory study of adults engaging in high-risk sport of skiing.* Unpublished master's thesis, Rutgers University.

De Cuyper, N., Mäkikangas, A., Kinnunen, U., Mauno, S., & Witte, H. D. (2012). Cross-lagged associations between perceived external employability, job insecurity, and exhaustion: Testing gain and loss spirals according to the conservation of resources theory. *Journal of Organizational Behavior, 33*(6), 770–788. doi: 10.1002/job.1800

Ditunno, P. L., & McCauley, C. (1985) Sensation-seeking behavior and the incidence of spinal cord injury. *Archives of Physical Medicine and Rehabilitation, 66*, 152–155.

Duda, J. L. (1993). Goals: A social-cognitive approach to the study of achievement motivation in sport. In R. N. Singer, M. Murphy & L. K. Tennant (Eds.), *Handbook of research in sport psychology* (pp. 421–436). New York: Macmillan.

Duda, J. L., Olson, L. K., & Templin, T. J. (1991). The relationship of task and ego orientation to sportsmanship attitudes and the perceived legitimacy of injurious acts. *Research Quarterly for Exercise and Sport, 62*, 79–87.

Duda, J. L. & Ntoumanis, N. (2003). Correlates of achievement goal orientations in physical education. *International Journal of Educational Research, 39*, 415–436.

Dunn, J. G. H., & Causgrove-Dunn, J. (1999). Goal orientations, perceptions of aggression, and sportpersonship in elite male youth ice hockey players. *The Sport Psychologist, 13*, 183–200.

Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods, 9*(4), 466–491.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis (6th ed.).* Upper Saddle River, N.J.: Prentice Hall.

Harwood, C., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology, 16*, 318–332.

Jöreskog, K. G. (2005). Structural equation modeling with ordinal variables using LISREL. Retrieved from http://www.ssicentral.com/lisrel/techdocs/ordinal.pdf

Kolditz, T.A. (2007). I*n extremis leadership. Leading as if your life depended on it.* San Francisco: John Wiley & Sons, Inc.

Landeweerd, J. A., Urlings, I. J. M., & DeJong, A. H. J. (1990). Risk tendency among construction workers. *Journal of Occupational Accidents, 11*, 183-196.

Muthén, B. O., du Toit, S. H. C., & Spisic, D. (1997). Robust inference using weighted least squares and quadratic estimating equations in latent variable modeling with categorical and continuous outcomes. *Conditionally accepted for publication in Psychometrika.*

Nicholls, J. G. (1992). The general and the specific in the development and expression of achievement motivation. In G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 31–56). Champaign, Illinois: Human Kinetics.

Nunnally, J. C. (1978). *Psychometric theory (2nd ed.)*. New York: McGraw-Hill.

Papaioannou, A., Zourbanos, N., Krommidas, C., & Ampatzoglou, G. (2012). The place of achievement goals in the social context of sport: A comparison of Nicholls' and Elliot's models. In Roberts, G. C. & Treasure, D. C. (Eds.), *Advances in Motivation in Sport and Exercise (3rd ed.)* (pp. 59-90). Champaign, IL: Human Kinetics.

Parmak, M., Mylle, J. J. C., & Euwema, M. C. (2014). Sensation seeking and perceived need for structure moderate soldiers' well-being before and after deployment. *Military and Behavioral Health, 2*, 75–81.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. doi: 10.1037/0021-9010.88.5.879

Ripa, C. P. L., Skovdahl Hansen, H., Lykke Mortensen, E., Sanders, S. A., & Reinisch, J. M. (2001). A Danish version of the sensation seeking scale and its relation to a broad spectrum of behavioral and psychological characteristics. *Personality and Individual Differences*, *30*, 1371-1386

Roberts, G. C., Treasure, D. C., & Balague, G. (1998). Achievement goals in sport: The development and validation of the perception of success questionnaire. *Journal of Sports Sciences, 16*, 337–347.

Schnell, A., Mayer, J., Diehl, K., Zipfel, S. & Thiel, A. (2014). Giving everything for athletic success! - Sport-specific risk acceptance of elite adolescent athletes. *The Psychology of Sport and Exercise, 15*, 165–172.

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport & Exercise Psychology, 14*, 375-391.

Smith, R. E., Ptacek, J. T., & Smoll, F.L. (1992). Sensation seeking, stress, and adolescent injuries: A test of stress-buffering, risk-taking and coping skills hypotheses. *Journal of Personality and Social Psychology, 62*, 1016–1024.

Taimela, S., Kujala, U. M., & Osterman, K. (1990). Intrinsic risk factors and athletic injuries. *Sports Medicine, 9*, 205–216.

Turner, C., McClure, R., & Pirozzo, S. (2004). Injury and risk-taking behavior – a systematic review. *Accident and Injury Prevention, 36*, 93–101.

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking.* Cambridge: Cambridge University Press.

Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington: American Psychological Association.

Table 1

Descriptive Statistics, Scale Reliabilities, and Bivariate Correlations

Variables	Mean	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Injury T1	.55	.50											
2. Gender T1	1.10	.30	-.01										
3. Age T1	23.61	2.63	.05	-.06									
4. Performance climate T1	3.14	.73	.11	-.04	.01	(.85)							
5. Mastery climate T1	3.75	.62	-.01	-.19**	.01	-.16*	(.86)						
6. Performance orientation T1	3.03	.96	.03	-.08	-.16*	.22*	.09	(.95)					
7. Mastery orientation T1	4.17	.87	-.04	.02	-.01	-.22**	.45**	.15*	(.96)				
8. Thrill and adventure T1	8.47	1.74	-.01	-.12	-.05	-.14*	.15*	.08	.17**	(.86)			
9. Experience seeking T1	5.10	1.67	.09	.10	.12	-.15*	.02	-.06	.24**	.13*	(.64)		
10. Boredom susceptibility T1	4.03	1.89	.06	-.08	-.05	.09	-.04	.17**	-.04	.20**	.02	(.59)	
11. Disinhibition T1	6.66	1.91	.04	-.23**	-.12	.04	.12	.19**	.04	.25**	.00	.31**	(.73)
12. Injury T2	.51	.50	.14	-.06	-.03	-.04	.04	.20*	.03	.12	.04	.01	.22*

Note: N = 248 (T1); N = 141 (T2). Scale reliabilities (composite reliability estimates) are displayed on the diagonal.

*p < .05
**p < .01

Table 2

Multiple Regression Analysis for Predicting Disinhibition

	Disinhibition T1 (Step 1)
Control variables	
Gender[a]	-.21**
Age T1	-.11
Mastery climate T1	.06
Performance climate T1	.01
Mastery orientation T1	-.01
Independent variable	
Performance orientation T1	.15*
F	4.06***
R^2	.10

Note. $N = 248$.

*$p < .05$.
**$p < .01$.
***$p < .001$.

[a] Men = 1, women = 2.

Table 3

Logistic Regression Analyses for Predicting Injury

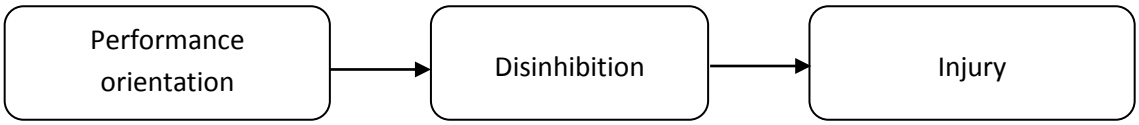
	Injury T2 (Step 2)		Injury T2 (Step 3)	
	B	*Odds Ratio*	*B*	*Odds Ratio*
Control variables				
Injury T1	-.48	.62	-.55	.58
Gender[a]	.04	1.04	-.40	.67
Age T1	-.01	.99	.03	1.03
Performance climate T1	-.12	.89	-.08	.92
Mastery climate T1	-.01	.99	-.05	.95
Thrill and adventure T1	.15	1.58	.14	1.15
Experience seeking T1	.01	1.01	-.02	.98
Boredom susceptibility T1	-.05	.96	-.15	.86
Mastery orientation T1	.07	1.07	.13	1.14
Independent variable				
Performance orientation T1	.42*	1.52	.31	1.36
Mediator				
Disinhibition T1			.29*	1.33
Model deviance (-2LL)	173.74		168.44	
Nagelkerke R^2	.09		.14	

Note. $N = 141$.

*$p < .05$.
**$p < .01$.
***$p < .001$.

[a] Men = 1, women = 2.

Figure 1. Conceptual model



[i] The achievement goal literature uses two different terminologies. In the study by Duda (2003), a task-involved mode is contrasted with an ego-involved task. We use terminology that distinguishes between mastery-orientation and performance-orientation, here and in the rest of the article.