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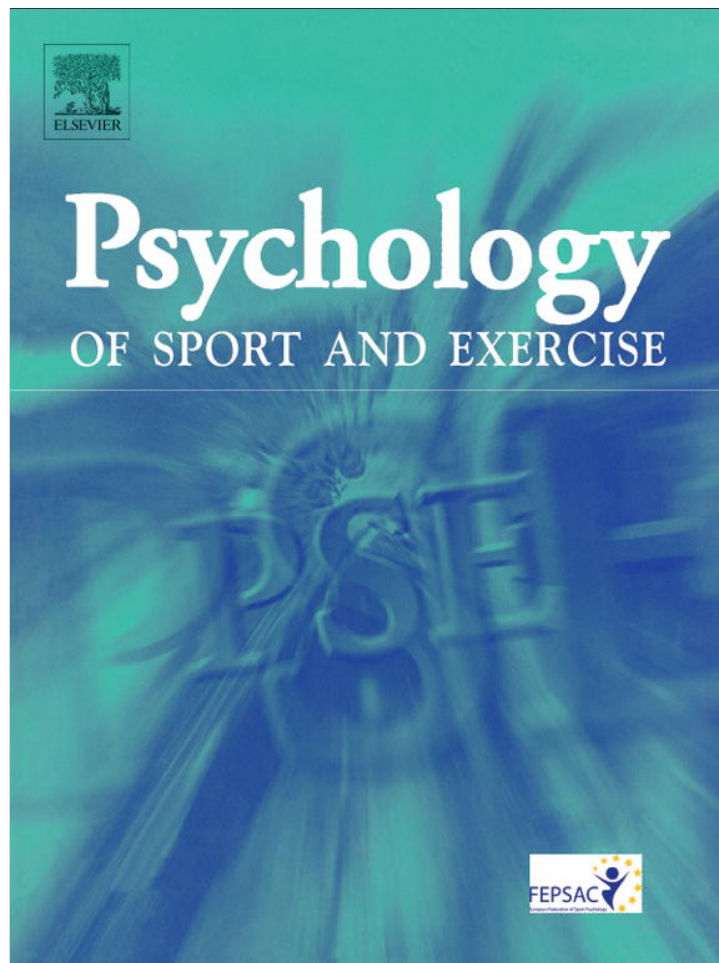
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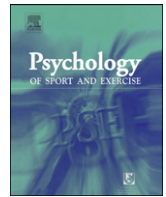
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Short communication

Personality, self-efficacy and risk-taking in parkour (free-running)

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ABSTRACT

Objective: To assess the effect of self-efficacy on the relationship between personality and risk-taking in parkour/free-running, a growing high-risk sport.

Design: Quantitative cross-sectional study.

Method: 277 parkour and free-running practitioners were recruited online to complete a survey assessing Big Five personality traits, self-efficacy and perceived risk-taking.

Results: Greater reckless risk-taking behaviours were associated with high neuroticism ($p = .013$) and low conscientiousness ($p = .004$). Mediation analysis showed that self-efficacy exerted a significant (95% CI) indirect mediation on the relationship between personality traits of neuroticism and conscientiousness, and risk-taking. Extraversion did not predict risk-taking, and was not significantly mediated by self-efficacy.

Conclusions: Self-efficacy plays a significant mediation role in the relationship between stable traits of neuroticism and conscientiousness, and risk-taking amongst parkour/free-running practitioners. This may help elucidate reasons underlying risky sports behaviours.

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The association between personality and risk-taking has been frequently investigated, with various studies exploring the relationship between Big Five factors (openness, conscientiousness, extraversion, agreeableness and neuroticism; Costa & McCrae, 1992) and risk propensity across different life domains (Nicholson, Soame, Fenton-O'Creevy, & Willman, 2005). For example, Sutin et al. (2010) found that higher neuroticism and lower conscientiousness were associated with high-risk health behaviours such as smoking, and in turn with higher physical health morbidity and mortality rates. Low conscientiousness had also been significantly associated with unsafe driving behaviours (Schwebel, Severson, Ball, & Rizzo, 2006).

Risk-taking behaviours in extreme sports, such as skydiving, surfing and mountaineering, are often perceived differently to risk-taking in other life domains (e.g., gambling, reckless driving or sexual behaviour) because of their greater social acceptability (Castanier, Le Scanff, & Woodman, 2010). This is supported by empirical findings that risk-taking appears to be context-specific and not generalisable for a person across all life domains (Lo, Repin, & Steenbarger, 2005). For instance, someone who regularly enjoys high-risk sports may be very cautious with their personal finances. Consequently, there exists a discrete body of literature

that has primarily focused on individual differences that discriminate between participants and non-participants in extreme (i.e., high-risk) sports (Jack & Ronan, 1998; Tok, 2011).

Much of this work has focused on narrowly defined traits such as sensation seeking (Zuckerman, 1994) wherein associations with extreme sport participation would primarily represent a demonstration of construct validity. Concerns regarding the utility of this approach, and of equivocal findings, have been highlighted previously (Slanger & Rudestam, 1997). In contrast, less research has examined the association between participation in extreme sport and major personality domains (Llewellyn & Sanchez, 2008). One recent study found that individuals who participated in diving, surfing, climbing and other risky sports had higher scores on Big Five traits of extraversion and openness to experience, and lower levels of conscientiousness and neuroticism (Tok, 2011).

The relationship between personality and risk-taking within samples of extreme sport practitioners has received even less attention. This is important, as differences in personality traits that discriminate between extreme sport practitioners and control groups may not generalize to associations with risk-taking within extreme sport. For example, high neuroticism may reduce risk-taking if the individual's anxiety prevents them from ever engaging in high-risk/extreme sports, while it might increase risk-taking if practitioners use such behaviours as a means to regulate affect and cope with stress (Woodman, Cazenave, & Le Scanff, 2008; Woodman, Hardy, Barlow, & Le Scanff, 2010).

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Castanier et al. (2010) investigated the influence of Big Five personality traits on risk-taking across a range of high-risk sport participants. They used a typology approach (cf., Vollrath & Torgersen, 2002), creating eight personality types from (high/low) combinations of extraversion, neuroticism and conscientiousness. Greater perceived risk-taking behaviour was associated with low conscientiousness, high neuroticism and high extraversion (this type reported the most risk-taking and accidents, while types combining low conscientiousness and either high extraversion or high neuroticism were also more risk-taking than the remaining five typologies). Despite the limitations of the study (e.g., the median-split typology approach), it does provide an important first examination of the effect of major personality traits, namely extraversion, neuroticism and conscientiousness, on risk-taking behaviour within a sample of extreme sports practitioners.

These same personality traits have also been shown empirically to be related to self-efficacy. For instance, Hoyle (2006) noted that high self-efficacy was associated with high conscientiousness and low neuroticism. This is in line with Judge and Ilies' (2002) meta-analysis of 65 studies examining Big Five traits and self-efficacy, which also noted a positive correlation between self-efficacy and extraversion. Bandura (1982) defined self-efficacy as a cognitive mediation between knowledge and action, or "judgments of how well one can execute courses of action required to deal with prospective situations" (p. 122).

Self-efficacy may therefore also be an important influence on risk-taking behaviour. However, the relationship between self-efficacy and risk-taking has not been widely studied within the specific domain of extreme sports. Slanger and Rudestam (1997) found that self-efficacy discriminated risk-taking groups, while within samples of extreme sport practitioners, Llewellyn, Sanchez, Asghar, and Jones (2008) found that higher self-efficacy was significantly correlated with riskier climbing behaviours. Llewellyn and colleagues argued that higher self-efficacy led to more *calculated*, as opposed to *reckless*, risk-taking.

Bandura (1982) had found that individuals with higher induced self-efficacy rated their state neuroticism as lower, and performed better in perceived high-risk situations. Later, he observed that high self-efficacy led to greater risk-taking for individuals with low trait neuroticism (Bandura, 1997). This suggests that the level of a personality trait alone is not sufficient to determine risk-taking, but rather that the cognitive facets concerning perceived abilities, represented by self-efficacy, influence the final risk-taking behaviours. Since mediators account for how or why a relationship occurs between predictor and criterion variables (Baron & Kenny, 1986), self-efficacy could therefore be a mediator for the relationship between personality and risk-taking.

Although Bandura (1997) alluded to a possible mediation effect of self-efficacy in the relationship between personality traits and risk-taking, this has not been tested within high-risk sports using mediation modelling. In keeping with the relationships reported between major personality traits (Castanier et al., 2010), self-efficacy (Llewellyn & Sanchez, 2008) and risk-taking, and the known association between personality and self-efficacy (e.g., Judge & Ilies, 2002), a primary aim of the present study was to examine self-efficacy as a potential mediator between personality traits and risk-taking within a sample of parkour and free-running practitioners.

Parkour is a relatively new sport, existing as a recognised discipline since c.1990 (Edwardes, 2009). The little academic attention on parkour to date has typically explored its socio-political functions in contesting urban space (Brunner, 2011; Guss, 2011). Fewer studies still have considered psychology in parkour (e.g., Cazenave, 2007; Cazenave & Michel, 2008). However, Taylor, Witt, and Sugovic (2011) found that practitioners (traceurs)

consistently perceived the height of a high wall, a typical parkour obstacle, as lower than a control group, suggesting a link between practicing parkour and changes in cognitive style. Since self-efficacy captures cognitions at a point in time, self-efficacy may also therefore change with practice and training.

This study builds on previous work with extreme sport samples, to examine perceived reckless risk-taking in parkour. The study hypothesises (a) that higher neuroticism and extraversion, and lower conscientiousness might each be associated with higher risk-taking, and (b) that self-efficacy may mediate the relationship between each of these three key personality traits and risk-taking. In doing so, the study seeks to combine the link between personality and risk-taking (Castanier et al., 2010) with the role of self-efficacy in risk-taking (Llewellyn et al., 2008) and cross-validate the previously reported associations in a novel sample of extreme sport practitioners.

Method and materials

Participants and procedure

Participants were traceurs and free-runners recruited through the Parkour Generations website (www.parkourgenerations.com). The survey was voluntary and conducted online. 384 people gave informed consent to participate. Of these, 107 (27.9%) provided incomplete data, leaving 277 participants' data for analysis. The sample comprised predominantly male participants ($n = 242$, 87.4%), amongst whom the sport is more popularly practiced. Participants ranged from 16 to 41 years old, although the sample was skewed towards younger participants ($M = 22.4$, $SD = 5.30$). Participants' experience at parkour ranged from <1 to 17 years of training ($M = 3.6$, $SD = 2.55$). This skew is likely to reflect the fact that parkour first came to the UK in 2004; few participants ($n = 10$, 3.6%) therefore had >8 years experience.

Measures

After recording their age, gender and years experience in parkour, participants completed a 10-item Parkour Self-Efficacy Scale (PaSES). The PaSES was adapted from the Climbing Self-Efficacy Scale (CSES; Llewellyn et al., 2008). Due to the similarity of the sports, the word 'climbing' in the CSES was replaced with 'parkour' in the modified version, before piloting with senior Parkour Generations members. The PaSES asked participants to rate their confidence in their abilities across ten domains of the sport. Each item is rated on a scale of 0–100 ('Not at all confident' to 'Extremely confident'), yielding a total between 0 and 1000. Higher scores indicated greater self-efficacy.

Participants then responded to a 3-item scale, adapted from Castanier et al. (2010), to assess perceived risk-taking behaviours during parkour. Each item employed a 5-point Likert scale, with one item reverse scored. After coding, the scale yielded a total score for risk-taking between 3 (minimum) and 15 (maximum). Finally, participants completed a 30-item IPIP-NEO personality questionnaire (Goldberg et al., 2006).

Hierarchical multiple regression analysis assessed the indirect mediation effects of self-efficacy on the relationship between specific personality traits (neuroticism, conscientiousness and extraversion) and risk-taking. Gender and age were included as covariates (parkour experience was not significantly related to risk-taking and therefore excluded). The indirect mediation effect of self-efficacy on the relationship between specific personality traits, and risk-taking was formally tested using the *Mediate* SPSS macro (Preacher & Hayes, 2008).

Results

Data analysis

PaSES responses ranged from 81 to 1000 ($M = 723.15$, $SD = 154.56$). Reliability analysis of PaSES responses yielded a Cronbach's α of 0.90, showing good internal consistency. Risk-taking behaviour scale responses ($N = 277$) ranged from 3 to 13 ($M = 5.65$, $SD = 1.96$), and mean inter-item correlation was acceptable at 0.21 (Briggs & Cheek, 1986).

As expected, there were small, but significant, correlations between neuroticism and conscientiousness and risk-taking (Table 1). No other Big Five correlations with risk-taking, including extraversion, were significant. Risk-taking was negatively correlated with age ($r = -.22$, $p < .001$), with males ($M = 5.77$, $SD = 1.99$) more risk-taking than females ($M = 4.83$, $SD = 1.52$, $p = .008$).

Self-efficacy was negatively related with neuroticism and risk-taking, while positively related to conscientiousness and extraversion (Table 1). In addition, greater self-efficacy was significantly associated with parkour experience ($r = .30$, $p < .001$) and higher in males ($M = 743$, $SD = 137$) than females ($M = 586$, $SD = 197$, $p < .001$).

An initial regression revealed that the predictor variables accounted for significant variance in self-efficacy, $F(5,260) = 24.46$, $p < .001$, $R^2 = .32$, with both conscientiousness ($\beta = .295$, $p < .001$) and neuroticism ($\beta = -.236$, $p < .001$) contributing significant unique variance while the coefficient for extraversion was not significant ($\beta = .087$, $p = .10$).

Table 2 shows the second stage of indirect mediation analysis, which proposed self-efficacy (PaSES score) as a mediator for effects of conscientiousness, neuroticism and extraversion on risk-taking. Once self-efficacy was introduced into the original model (Model 1) as a mediator for risk-taking, the individual effects of conscientiousness and neuroticism on risk-taking were no longer significant (Model 2). Effect size for conscientiousness was -0.19 (95% CI -0.37 to -0.03) and 0.13 for neuroticism (95% CI 0.02 – 0.26). Confidence intervals (95%) for conscientiousness and neuroticism were outside zero, meaning that these results were significant at the 0.05 level. Self-efficacy (PaSES score) therefore exerted a significant indirect mediation effect on the relationship between both conscientiousness and neuroticism, and risk-taking. Extraversion was non-significant, with an effect size of -0.05 (95% CI -0.15 to 0.01).

Discussion

To our knowledge, this was the first study to apply Big Five trait theory to the sport of parkour/free-running. Results were in line with previous work that identified low conscientiousness and high neuroticism as key Big Five traits associated with greater self-reported risk-taking behaviours in extreme sports (Castanier et al., 2010). Conscientiousness and neuroticism were found to be significantly mediated by self-efficacy in their effects on risk-taking. Though no high-risk sports studies could be found to which this finding can be directly compared, the relationship between

Table 2

Individual predictor variables in risk-taking models.

	Risk-taking					
	Model 1			Model 2		
	β	t	p	β	t	p
Self-efficacy				-.187	-2.67	.008
Conscientiousness	-.155	-2.53	.012	-.100	-1.56	.121
Extraversion	.086	1.40	.163	.103	1.67	.095
Neuroticism	.156	2.52	.012	.112	1.76	.079
R^2		.109			.133	
$F_{(sig.)}$		6.35 (<.001)			6.60 (<.001)	
<i>Covariates</i>						
Age	-.196	-3.25	.001	-.191	-3.19	.002
Gender	.142	2.30	.022	.198	3.06	.002

conscientiousness, neuroticism and self-efficacy was consistent with that found in Judge and Ilies' (2002) meta-analysis.

The significant mediation effect of self-efficacy on the relationship between both conscientiousness and neuroticism, and risk-taking presents an account of how broadly-defined personality traits might come to be associated with risk-taking in extreme sport. This is also useful in understanding high-risk sports behaviours and the importance of training. The significant correlation of experience and self-efficacy suggests that self-efficacy increases over time with training, a proposal supported by an analogous finding in rock climbing (Llewellyn et al., 2008). This highlights the potential benefits of addressing dimensions of self-efficacy within structured training courses, and parkour coaching qualifications. Moreover, mediation models for self-efficacy could be explored in other high-risk sports as well as wider domains such as health and safety.

In contrast with Castanier et al. (2010), extraversion was not found to be significantly associated with risk-taking, nor was extraversion significantly mediated by self-efficacy. However, the typology approach used by Castanier et al. did not provide clear evidence of a main effect of extraversion upon risk-taking. Instead, their data is more suggestive of interactive trait effects, which provides a potential avenue for future research.

The relationship between self-efficacy and risk-taking observed in the present study (a negative correlation) was opposite to that found by Llewellyn et al. (2008). This is likely due to differences in risk-taking constructs. The risk-taking scale used in this study was adapted from Castanier et al. (2010). It was short (three items) and related only to perceived reckless risk-taking behaviours, for instance being involved in accidents due to an irresponsible attitude. By contrast, Llewellyn and colleagues operationalised risk through climbing type and frequency, thus interpreting their findings in the light of calculated risk-taking. A more sensitive and substantive risk-taking scale would seek to capture both reckless and calculated risk-taking and assess their independence as factors.

A further limitation of the study was that over a quarter of respondents (27.9%) supplied incomplete data, potentially biasing the sample towards more conscientious practitioners. Nevertheless, these findings suggest that the relationship between certain stable,

Table 1

Correlations between big five traits, risk-taking and self-efficacy ($N = 277$).

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientious-ness	Self-efficacy
Risk-taking	.15*	-.02	.02	-.10	-.17**	-.16**
Neuroticism		-.20**	-.04	-.08	-.23***	-.37***
Extraversion			.35***	.18**	.23***	.16*
Openness				.19**	.06	.07
Agreeableness					.27***	.13*
Conscientiousness						.36***

* $p < .05$, ** $p < .01$, *** $p < .001$ (all two-tailed).

long-term personality traits and propensity to take risks in parkour is affected significantly by a person's cognitive appraisal of their own parkour abilities. Moreover, the highly significant correlation between experience and self-efficacy suggests that those appraisals change over time, with training and practice, generally towards greater belief in one's own capabilities. This may help to elucidate some of the reasons underlying risky sports behaviours by providing insight into the role of self-efficacy. This paper adds to the limited literature exploring relationships between personality and risk-taking in extreme sport practitioners and demonstrates the potential use of the mediation model in domains other than sport.

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References

- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*, 122–147. <http://dx.doi.org/10.1037/0003-066X.37.2.122>.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- 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*, 1173–1182. <http://dx.doi.org/10.1037/0022-3514.51.6.1173>.
- Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality*, *54*, 106–148. <http://dx.doi.org/10.1111/j.1467-6494.1986.tb00391.x>.
- Brunner, C. (2011). Nice-looking obstacles: parkour as urban practice of deterritorialization. *AI & Society*, *26*, 143–152. <http://dx.doi.org/10.1007/s00146-010-0294-2>.
- Castanier, C., Le Scanff, C., & Woodman, T. (2010). Who takes risks in high-risk sports? A typological personality approach. *Research Quarterly for Exercise and Sport*, *81*, 478–484. <http://dx.doi.org/10.5641/027013610X13088600029418>.
- Cazenave, N. (2007). La pratique du parkour chez les adolescents des banlieues: entre recherche de sensation et renforcement narcissique. *Neuropsychiatrie de l'Enfance et de l'Adolescence*, *55*, 154–159. <http://dx.doi.org/10.1016/j.neurenf.2007.02.001>.
- Cazenave, N., & Michel, G. (2008). Conduites à risques et variation de l'estime de soi chez les adolescents: l'exemple du parkour. *Annales Médico-Psychologiques, Revue Psychiatrique*, *166*, 875–881. <http://dx.doi.org/10.1016/j.amp.2008.10.026>.
- Costa, P. T., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, *13*, 653–665. [http://dx.doi.org/10.1016/0191-8869\(92\)90236-1](http://dx.doi.org/10.1016/0191-8869(92)90236-1).
- Edwardes, D. (2009). *The parkour & freerunning handbook*. London: Virgin Books.
- Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., et al. (2006). The international personality item pool and the future of public domain personality measures. *Journal of Research in Personality*, *40*, 84–96. <http://dx.doi.org/10.1016/j.jrp.2005.08.007>.
- Guss, N. (2011). Parkour and the multitude: politics of a dangerous art. *French Cultural Studies*, *22*, 73–85. <http://dx.doi.org/10.1177/0957155810386675>.
- Hoyle, R. H. (2006). Personality and self-regulation: trait and information-processing perspectives. *Journal of Personality*, *74*, 1507–1526. <http://dx.doi.org/10.1111/j.1467-6494.2006.00418.x>.
- Jack, S. J., & Ronan, K. R. (1998). Sensation-seeking among high- and low-risk sports participants. *Personality and Individual Differences*, *25*, 1063–1083. [http://dx.doi.org/10.1016/S0191-8869\(98\)00081-6](http://dx.doi.org/10.1016/S0191-8869(98)00081-6).
- Judge, T. A., & Ilies, R. (2002). Relationship of personality to performance motivation: a meta-analytic review. *Journal of Applied Psychology*, *87*, 797–807. <http://dx.doi.org/10.1037/0021-9010.87.4.797>.
- Llewellyn, D. J., & Sanchez, X. (2008). Individual differences and risk taking in rock climbing. *Psychology of Sport and Exercise*, *9*, 413–426. <http://dx.doi.org/10.1016/j.psychsport.2007.07.003>.
- Llewellyn, D. J., Sanchez, X., Asghar, A., & Jones, G. (2008). Self-efficacy, risk-taking and performance in rock climbing. *Personality and Individual Differences*, *45*, 75–81. <http://dx.doi.org/10.1016/j.paid.2008.03.001>.
- Lo, A. W., Repin, D. V., & Steenbarger, B. N. (2005). Fear and greed in financial markets: a clinical study of day-traders. *Cognitive Neuroscientific Foundations of Economic Behavior*, *95*, 352–359. <http://web.mit.edu/alo/www/Papers/AERPub.pdf>.
- Nicholson, N., Soame, E., Fenton-O'Creevy, M., & Willman, P. (2005). Personality and domain-specific risk-taking. *Journal of Risk Research*, *8*, 157–176. <http://dx.doi.org/10.1080/1366987032000123856>.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879–891. <http://dx.doi.org/10.3758/BRM.40.3.879>.
- Schwebel, D. C., Severson, J., Ball, K. K., & Rizzo, M. (2006). Individual difference factors in risky driving: the roles of anger/hostility, conscientiousness, and sensation-seeking. *Accident Analysis and Prevention*, *38*, 801–810. <http://dx.doi.org/10.1016/j.aap.2006.02.004>.
- Slinger, E., & Rudestam, K. E. (1997). Motivation and disinhibition in high risk sports: sensation seeking and self-efficacy. *Journal of Research in Personality*, *31*, 355–374. <http://dx.doi.org/10.1006/jrpe.1997.2193>.
- Sutin, A. R., Terracciano, A., Deiana, B., Naitza, S., Ferrucci, L., Uda, M., et al. (2010). High neuroticism and low conscientiousness are associated with interleukin-6. *Psychological Medicine*, *40*, 1485–1493. <http://dx.doi.org/10.1017/S0033291709992029>.
- Taylor, J. E. T., Witt, J. K., & Sugovic, M. (2011). When walls are no longer barriers: perception of wall height in parkour. *Perception*, *40*, 757–760. <http://dx.doi.org/10.1068/p6855>.
- Tok, S. (2011). The big five personality traits and risky sport participation. *Social Behavior and Personality*, *39*, 1105–1111. <http://dx.doi.org/10.2224/sbp.2011.39.8.1105>.
- Vollrath, M., & Torgersen, S. (2002). Who takes health risks? A probe into eight personality types. *Personality and Individual Differences*, *32*, 1185–1197. [http://dx.doi.org/10.1016/S0191-8869\(01\)00080-0](http://dx.doi.org/10.1016/S0191-8869(01)00080-0).
- Woodman, T., Cazenave, N., & Le Scanff, C. (2008). Skydiving as emotion regulation: the rise and fall of anxiety is moderated by alexithymia. *Journal of Sport & Exercise Psychology*, *30*, 424–433. <http://journals.humankinetics.com/jsep-back-issues/JSEPVOLUME30Issue3June>.
- Woodman, T., Hardy, L., Barlow, M., & Le Scanff, C. (2010). Motives for participation in prolonged engagement high-risk sports: an agentic emotion regulation perspective. *Psychology of Sport and Exercise*, *11*, 345–352. <http://dx.doi.org/10.1016/j.psychsport.2010.04.002>.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press.