



# Risk-taking and impulsive personality traits in proficient downhill sports enthusiasts



Amelia M. Maher<sup>a</sup>, Cynthia J. Thomson<sup>b</sup>, Scott R. Carlson<sup>a,\*</sup>

<sup>a</sup> Department of Psychology, University of Minnesota Duluth, Duluth, MN, USA

<sup>b</sup> Department of Kinesiology and Physical Education, University of the Fraser Valley, Chilliwack, British Columbia, Canada

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## ABSTRACT

Although past studies have examined how personality traits may motivate participation in high-risk sports, few previous studies have examined impulsive personality correlates with risk-taking within a group of sports enthusiasts. We examined relationships between measures of personality and risk-taking on the slopes as measured by a sport-specific Sensation Seeking Scale in a sample of proficient-level skiers and snowboarders ( $N = 123$ , 61% male). Significant correlations were found between risk-taking and multiple traits including Reward Sensitivity, Punishment Sensitivity, and Sensation Seeking, implying that some traits that motivate participation in high-risk sports also lead to more risky behavior while participating in said sports. Rash Impulsivity, though not found to distinguish participants from non-participants in previous studies, did correlate with risk-taking behavior on the slopes. The results of this study show that while some aspects of impulsive personality may motivate risky sport participation, other traits may be related to risky behavior once engaged in the sport.

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## 1. Introduction

Personality traits contributing to apparently reckless or impulsive behavior can have their effect through one of at least two routes: they can supply motivation for engaging in that behavior, or they can interfere with the implementation of behavioral controls while engaged in relevant behavior. The former situation may involve an active person-environment correlation in which personality influences the extent to which people actively seek out environments that support risky behavior. Once in those contexts the latter type of personality influence may further determine the extent to which behavior is reckless. An example of this is downhill winter sport such as skiing and snowboarding that are associated with elevated risk of injury or death, yet are still popular perhaps because of the thrills related to them. Thomson and Carlson (2014) found differences in impulsive traits with potential motivational significance (i.e., Reward and Punishment Sensitivity) between non-sport participants, beginners, and more proficient skiers or boarders. Traits related to low effortful control, however, did not vary with downhill sport participation.

Reward and Punishment Sensitivity may provide motivation for approaching and avoiding opportunities for engaging in risky behavior, respectively. Low effortful control, or Rash Impulsivity, however may still be related to the extent that individuals take risks while engaging in those behaviors even if it does not provide motivation leading to the context supporting that behavioral opportunity. It is unknown whether the same traits that lead people to participate in sports also influence risk-taking while engaging in said sports. Demonstration of such an association with Rash Impulsivity and downhill risk-taking would have implications not just for safety on the slopes, but also for the study of personality and risk-taking behavior more broadly speaking, as traits which do not relate to differences between groups that engage in risky behavior may still explain within-group differences in the intensity or frequency of risks taken.

The Reinforcement Sensitivity Theory (RST; Gray & McNaughton, 2000) provides insight into the biological processes that may influence risk taking. Individuals may exhibit risky behavior due to either under-sensitivity to possible punishment or over-sensitivity to reward. The RST describes three motivational systems that are thought to form the biological basis of two of the hypothesized dimensions of impulsivity: Reward Sensitivity and Punishment Sensitivity. The Behavioral Approach System (BAS) responds to rewards, cues of reward, and escape from punishment or unpleasant stimuli. The Behavioral Inhibition System (BIS) is

\* Corresponding author at: Department of Psychology, University of Minnesota Duluth, 320 Bohannon Hall, 1207 Ordean Court, Duluth, MN 55812-3010, USA. Tel.: +1 (218) 726 6428; fax: +1 (218) 726 7186.

E-mail address: [carls116@d.umn.edu](mailto:carls116@d.umn.edu) (S.R. Carlson).

involved in resolving conflicts brought on by the concurrent activation of the BAS and a third system, the Fight–Flight–Freeze System (FFFS). While the FFFS is activated by threats, cues of punishment, and loss of expected reinforcement, the BIS potentially inhibits behavior in an attempt to resolve ongoing conflicts when there are stimuli simultaneously present that are associated with approach and avoidance (Gray & McNaughton, 2000).

Rash Impulsivity is a third dimension from outside the RST that has emerged as being separate from Reward and Punishment Sensitivity (Cross, Copping, & Campbell, 2011; Dawe, Gullo, & Loxton, 2004). It involves a tendency to act without considering the consequences. Such behavior may reflect limitations in functioning of the orbital and ventromedial prefrontal cortex, which are necessary for executive control of behavior (Congdon & Canli, 2008). These executive control limitations may diminish an individual's ability to inhibit reckless behavior. A fourth dimension, Sensation Seeking, has also been tied to impulsivity and may emerge from the combination of high Reward and low Punishment Sensitivity (Cross et al., 2011). Sensation Seeking tendencies may lead people to “push the limits” of the activities they are engaging in so as to fulfill their need for novel stimulation. According to Franques et al. (2003), sensation seeking may provide an underlying link between socially acceptable behaviors such as risky sport participation and other behaviors such as substance use, which are more disinhibitory in nature.

The current investigation follows up the findings of Thomson and Carlson (2014) by using a measure of sport-specific risk taking (i.e., the Contextual Sensation Seeking Questionnaire for skiing and snowboarding; CSSQ-S; Thomson, Morton, Carlson, & Rupert, 2012) in the sample of proficient downhill athletes from that paper. Thomson and Carlson (2014)'s specifically found significant group differences between beginner and proficient downhill sport participants and non-sport participants in Extraversion, Sensation Seeking, BAS-related traits associated with enhanced anticipation

of reward, and potentially the more fear (as opposed to anxiety) related aspects of Punishment Sensitivity. These differences are consistent with motivational roles of these traits. People who are higher on traits related to Sensation Seeking and heightened approach towards rewards may actively seek out exposure to risky sports such as skiing and snowboarding, which provide excitement and a hedonic thrill. Being low on fear may eliminate a common motivation for avoiding such activities. However, for traits related to Rash Impulsivity, there were no significant differences between groups reported by Thomson and Carlson (2014). In the present study which traits within the proficient group are associated with participant's self-reported level of risky downhill behavior are examined. Although other studies have compared athletes to non-athletes, to our knowledge no previous report has examined the associations among impulsive personality traits and a specific measure of risk-taking on the slopes. We anticipated that participants scoring higher on the CSSQ-S would also score higher on Reward Sensitivity, and lower on Punishment Sensitivity. We further hypothesized that CSSQ-S scores would be positively correlated with Rash Impulsivity.

## 2. Methods

### 2.1. Participants

Participants were from a sample of 282 undergraduate students from a western Canadian university that was reported on in Carlson, Pritchard, and Dominelli (2013) and Thomson and Carlson (2014). Participants responded to a posting on a website describing extra credit research opportunities in the Psychology Department. Participants were selected for these particular analyses based on self-reported skiing and/or snowboarding ability. Only participants reporting intermediate ability or higher were included in analyses. After exclusions, 123 participants remained

**Table 1**  
Descriptive statistics and correlation coefficients for relationships between the CSSQ-S and impulsivity components and personality scale scores.

Variable	M	SD	r		
			Total (n = 123)	Males (n = 75)	Females (n = 48)
Rash Impulsivity	0.09	0.97	<b>0.474</b> **	<b>0.450</b> **	<b>0.566</b> **
ZKQP Impulsivity	20.82	5.08	<b>0.439</b> **	<b>0.380</b> **	<b>0.592</b> **
UPPS-P Negative Urgency	28.25	6.62	<b>0.213</b> *	0.221	<b>0.285</b> *
UPPS-P Positive Urgency	28.90	8.77	<b>0.324</b> **	<b>0.258</b> *	<b>0.443</b> **
Conscientiousness (rev)	25.94	6.16	0.176	0.137	0.218
UPPS-P Pre (Rev)	34.71	5.79	<b>0.417</b> **	<b>0.459</b> **	<b>0.467</b> **
UPPS-P Pers (Rev)	20.89	5.16	0.153	<b>0.227</b> *	0.122
ZKQP Sensation Seeking	37.76	8.72	<b>0.551</b> **	<b>0.492</b> **	<b>0.634</b> **
Reward Sensitivity	0.24	0.91	<b>0.204</b> *	<b>0.281</b> *	0.035
BAS RR	304.81	70.36	0.002	0.164	−0.264
BAS Drive	11.75	1.98	0.107	0.107	0.086
BAS Fun Seeking	12.59	2.42	<b>0.484</b> **	<b>0.578</b> **	<b>0.289</b> *
SPSRQ SR	13.57	4.62	<b>0.440</b> **	<b>0.438</b> **	<b>0.386</b> *
Punishment Sensitivity	−0.37	1.03	<b>−0.485</b> **	<b>−0.364</b> ** <sup>a</sup>	<b>−0.635</b> ** <sup>a</sup>
BIS	20.00	3.83	<b>−0.407</b> **	<b>−0.251</b> *	<b>−0.596</b> **
SPSRQ SP	10.18	5.35	<b>−0.394</b> **	<b>−0.289</b> *	<b>−0.540</b> **
Neuroticism	24.89	7.70	<b>−0.201</b> *	−0.128	−0.197
UPPS-P Sensation Seeking <sup>†</sup>	37.93	6.45	<b>0.625</b> **	<b>0.562</b> **	<b>0.691</b> **
Extraversion <sup>†</sup>	36.52	6.53	0.174	0.186	0.179
Remaining “Big Five” traits not in PCA					
Agreeableness	38.34	5.80	−0.017	0.033	−0.062
Openness	37.33	5.84	0.084	0.149	−0.027

Note: scales listed under summary PCA component scores are listed in order of loading on that component in Thomson and Carlson (2014).

Values shown in bold are statistically significant:

\*  $0.01 \leq p \leq 0.05$ .

\*\*  $0.001 \leq p \leq 0.01$ .

\*\*\*  $p < 0.001$ .

<sup>†</sup> Scale loaded negatively on PCA component.

<sup>a</sup> Within a row, r-values with the same superscript letter are statistically significantly different at  $\alpha = 0.05$ .

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