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Examining Profiles of the Big Five and Sensation Seeking among Competitive Climbers

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Credit author statement

JLR**:** Conceptualization, Data curation, Methodology, Formal analysis, Supervision, Original draft preparation, Reviewing and Editing. DJM: Software, Formal analysis, Reviewing and Editing. AMC: Investigation and Project administration. LJ: Original draft preparation, Reviewing and Editing.

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Abstract

The present study sought to identify distinct personality profiles in competitive climbers (N = 331, *Mean age* = 29.85, SD = 10.92), and also sought to explore whether these climbers differed in their sensation seeking tendencies based on these personality profiles. Employing a cross-sectional design, participants completed measures of the big five personality dimensions (agreeableness; conscientiousness; extraversion; neuroticism; openness to experience) and sensation seeking (boredom susceptibility; experience seeking; disinhibition; thrill and adventure seeking). Latent profile analysis identified four distinct big five personality profiles (Curious and Impulsive; Emotionally Unstable; Healthy; and Measured and Compliant). MANCOVA and follow-up ANCOVAs demonstrated significant differences between the four personality profiles in relation to thrill and adventure seeking, experience seeking, and disinhibition. The findings suggest that the identification of distinct personality profiles using a person-centred approach is a useful way of distinguishing and optimizing typical behaviors and preferences in adventure sports in the future.

Keywords: adventure sport, climbing, latent profile analysis, personality, risk taking.

Introduction

Understanding what characterizes a persons' involvement in specific sport and exercise activities has been of interest to psychologists for some time. A series of recent reviews highlights that the value of investigating personality traits is being reconsidered by many as an important endeavor (Allen et al., 2020; Hill & Madigan, 2017; Laborde et al., 2020; McEwan et al., 2019). Personality traits are associated with how people experience exercise (Jones et al., 2018), and have in various adventure sports been related to the experience of flow states (Boudreau et al., 2020); self-efficacy beliefs (Baretta et al., 2017); affect regulation (Castanier et al., 2010a); and injuries and risk-taking behaviors (Castanier et al., 2010b).

In the context of adventure sports, two common ways in which participation have been explained include the Five Factor Model (FFM; Costa & McCrae, 1992) of personality, and sensation seeking tendencies (Woodman et al., 2020). Sensation seeking is defined as the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience (Zuckerman, 1979). According to Zuckerman's (1979) theory of optimal levels of arousal, the life activities that people choose can generally be predicted by individuals' preferences for optimal levels of stimulation for activities and positive affect. Under *normal* activities, Zuckerman (1983) hypothesized that high sensation seekers would feel continuously under aroused and therefore need greater stimulation in order to reach their optimal level of arousal. Subsequently, hedonic allostasis theory (Koob & Le Moal, 1997) proposed that certain behaviors (i.e., sensation seeking) arise in response to hypoactivity in dopamine systems and aim to restore one's normal hedonic tone. Studies have also highlighted the role of motivational processing since sensation seeking may be driven by hyperactive approach (Joseph et al., 2009), or hypoactive avoidance brain systems (Zheng et al., 2019). In this regard, high sensation seekers may

display a lower sensitivity to experiencing adverse consequences in potentially dangerous but rewarding activities (i.e., a hyperactive approach system). In contrast, low sensation seekers may display an enhanced sensitivity to achieving their desired outcomes in the presence of risk or potential loss (i.e., a hypoactive avoidance system).

Although sensation seeking is considered a distinct personality construct, there is some evidence that it shares a large amount of variance with the big five personality factors (Castanier et al., 2010b; de Vries et al., 2009; McEwan et al., 2019; Russo et al., 2012). Specifically, psychology literature has concluded that sensation seeking shares a large proportion of variance with extraversion, openness to experience, and, to a lesser degree, conscientiousness and agreeableness (de Vries et al., 2009). Neuroticism on the other hand has been shown to share very little variance with sensation seeking (Russo et al., 2012). Conversely, in a recently published mapping review of personality studies in sport and exercise psychology (Laborde et al., 2020), it was concluded that traits related to sensation seeking were closely connected in definition to personality facets of: neuroticism (e.g., impulsiveness); extraversion (e.g., excitement seeking); and conscientiousness (e.g., deliberation). Furthermore, conscientiousness has been shown to have an inverse relationship with total sensation seeking (Jones et al., 2018) and risk-taking behaviors (Woodman et al., 2020).

Collectively, these findings highlight that shared variance may exist between the big five personality factors and sensation seeking within and beyond sport and exercise psychology domains. However, these findings could be a consequence of the nomothetic methodological approach that is often adopted in assessing these relationships (de Vries et al., 2009). Several studies have assessed the individual contribution of some or all FFM domains in predicting outcomes independently of one another (e.g., Breivik et al., 1998; Russo et al., 2012; for a review, see McEwan et al., 2019). This methodological approach is somewhat

unhelpful not least because the big five are highly correlated and therefore previous findings may unintentionally be the result of issues with multicollinearity. Moreover, in an applied context, people participating in sport and exercise may be more likely to exhibit a *profile* of the big five rather than exhibiting high scores in one of the domains and not the others (cf. Bleidorn et al., 2020; de Vries et al., 2009). Understanding whether personality profiles exist in certain adventure sports, such as climbing, can provide coaches and practitioners with an idiographic insight into why some climbers may approach or avoid challenging maneuvers, and why some climbers may consistently be at greater risk of injury than others. Moreover, identifying climbers' personality profiles may distinguish differences in their sensation seeking tendencies. In turn, this could provide new understanding on how interventions could be promoted in this specific adventure sport, to enhance safety education for some target groups whilst optimizing perception of gain during risky maneuvers for others.

The current study positions the importance of a person-centred approach (Marsh et al., 2009) to understanding the big five and its relationship to sensation seeking tendencies. A person-centred approach is a technique for identifying and describing subgroups of individuals (e.g., climbers) who are defined by similarities and differences in multidimensional constructs (e.g., personality) (Gustafsson et al., 2016). This may provide an advantage over traditional variable-centred techniques (e.g., regression) as it could enable the identification of personality profiles to which individuals may belong. Furthermore, by identifying such subgroups and how they relate to, for example, sensation seeking tendencies, psychologists can use this information to transition away from cross-sectional designs to assess idiographic changes over time, as well as shape the development and evaluation of interventions for target groups.

In this study, we place greater emphasis on a person's interconnected personality profile rather than the independent assessment of separate variables. In doing so, we treat the

construct of the FFM as a multidimensional interrelated construct (de Vries et al, 2009). The first purpose of this study was to explore whether distinct profiles can be identified among competitive climbers on the FFM domains using latent profile analysis (LPA). In comparison to cluster analysis, LPA has the advantage of calculating probability estimates of group membership and fit indices to more reliably differentiate between multiple profile solutions (Marsh et al., 2009). A second purpose was to explore whether distinct personality profiles amongst the climbers differed in relation to their sensation seeking tendencies. Informed by extant literature examining person-centred approaches to understanding the FFM model (e.g., Bleidorn et al., 2020; de Vries et al, 2009), we expected that personality profiles would emerge, and may differentiate climbers in relation to their specific sensation seeking tendencies.

Method

Participants and Procedure

Following institutional ethics approval, a sample of 331 climbers (51% male, 49% female; 89% British nationality) was recruited through national climbing clubs and organizations[1]. These organizations were initially contacted by email, informed of the purpose of the study, and asked to share an online questionnaire with their members via their official club webpages and social media. Prior to completing the online questionnaire, participants were provided with an online information sheet and consent form, which explained the study, clarified the anonymity and confidentiality of the data to be collected, and reminded participants of their right to withdraw from the study at any time. A priori

[1] Climbing involves using one's body to ascend a steep landscape (natural or man-made) object. The activity is carried out for recreational and competitive purposes and can be completed indoors and outdoors. There are a vast range of climbing activities that individuals participate in. A selection of these types of climbing activity include: Bouldering; buildering; free climbing; ice climbing; mountaineering; rope climbing; scrambling; sport climbing; and traditional climbing. Each climbing activity can typically be distinguished by the chosen climbing area and environment, and the degree to which safety equipment is used for safety purposes only, or to also assist in climbing progress (Cinnamon, 2000).

power analysis using G*Power 3.01 indicated that a minimum sample size of 305 would be appropriate to detect a small effect size (f^2 = 0.02) based on a power value of .90 and an alpha of 0.05. This power analysis was also determined on the basis of hypothesizing five distinct big five personality classes from the latent class profile analysis to be conducted. A minimum sample size of 305 is approximately in line with previous psychology literature examining the same construct relationships (personality and sensation seeking) with undergraduate student populations (de Vries et al., 2009). We therefore originally targeted a sample size of over 340 to account for a 10% dropout and / or data missing at random. Climbers' mean age was 29.85 years (*SD* = 10.92) with an average of 9.42 years of experience (*SD* = 8.80) and they identified bouldering (48%), sport climbing (27.5%), or traditional climbing (23.3%) as their main form of competitive participation. Fifty-three percent chose outdoor climbing as their main form of climbing environment.

Measures

An online questionnaire (Qualtrics) was administered to collect demographic information and responses to the big five personality domains, and sensation seeking tendencies. This questionnaire took approximately 10 minutes to complete. All subscales demonstrated acceptable internal consistency (i.e., Cronbach's alpha > .70; Nunnally, 1978).

Big five personality domains. The International Personality Item Pool (IPIP: Goldberg et al., 2006) version of the revised NEO personality inventory (NEO-PI-R: Costa & McCrae, 1992) provided 10 items each for extraversion (α = 0.87; "I feel comfortable around people"); neuroticism (α = 0.87; "I often feel blue"); conscientiousness (α = 0.79; "I carry out my plans"); agreeableness (α = 0.72; "I believe that others have good intentions"); and openness to experience (α = 0.75; "I have a vivid imagination"). Previous research supports the reliability and validity of the five subscales (Jones et al., 2018; Rumbold et al., 2020). Participants rated the extent to which each item described them accurately on a 5-point scale

(1 = “strongly disagree”, 5= “strongly agree”).

Sensation seeking. The Sensation Seeking Scale - Form V (SSS V; Zuckerman, Eysenck, & Eysenck, 1978) measures a person’s general preferences for thrill and adventure seeking (10 items; $\alpha = 0.97$; “I sometimes like to do things that are a little frightening”); experience seeking (10 items; $\alpha = 0.71$; “I like to explore a strange city or section of town by myself even if it means getting lost”); disinhibition (8 items; $\alpha = 0.96$; “I like to have new and exciting experiences and sensations even if they are a little frightening / unconventional”); and boredom susceptibility (10 items; $\alpha = 0.71$; “I get bored seeing the same old faces”). Each of the 38 items contained two statement choices. Participants were asked to select the statement that best described their likes or the way they feel. Two items were omitted due to a pilot test indicating high participant non-completion due to the perceived homophobic nature of these items. The four subscales have demonstrated satisfactory to good internal consistency in previous studies (e.g., Frenkel et al., 2019; Roberti et al., 2003).

Data Analysis

Initial data screening, descriptive statistics, alpha coefficients, bivariate, and biserial correlations (see Table 1) were calculated using IBM SPSS Statistics version 24. Latent profile analysis (LPA) was then conducted with M*plus* version 7.3 (Muthén & Muthén, 1998-2012) to identify consistent profiles within the sample based on their big five personality domain scores (Marsh et al., 2009). The benefit of this approach is that class membership to specific big five domain interactions can be inferred from the relationship between a person’s agreeableness; conscientiousness; extraversion; neuroticism; and openness to experience. Moreover, these classes can be used to examine individual differences in competitive climbers’ sensation seeking preferences. We followed the recommendations of previous studies that have employed LPA and used the following criteria to assess best model fit: Bootstrap Likelihood Ratio Test (BLRT); Bayesian Information Criteria (BIC); Sample Size-

Adjusted BIC (SSABIC); entropy values; and, the average latent class probabilities for each profile solution (e.g., for a more detailed explanation, see Gustafsson et al., 2016; Marsh et al., 2009). We used 500 random start values for each model, with the 50 best retained for the final solution. We then applied 1500 random start values to avoid local maxima (cf. Gustafsson et al 2016).

Multivariate analysis of covariance (MANCOVA) was used to examine differences between big five personality profiles in terms of sensation seeking, whilst including sex as a covariate. Sex was included as a covariate since previous research has underlined that sensation seeking tendencies may differ between males and females (Cross et al., 2013; Zuckerman, 1979; Zuckerman et al. 1978). Our biserial correlations also showed that sex was related to all sensation seeking subscales (see Table 1).

Results

Latent Profile Analysis of the Big Five

Table 2 shows the model fit statistics and profile membership distribution of participants for the big five personality domains. Average posterior probabilities for the final four-profile model chosen were as follows: class 1 = 0.83; class 2 = 0.82; class 3 = 0.75; and class 4 = 0.78. Figure 1 illustrates the plot of four distinct big five personality profiles in the competitive climbers sampled (N = 331). Class 1 climbers (n = 62) were characterized by relatively high scores on extraversion, conscientiousness, agreeableness and openness to experience, whilst displaying relatively low scores on neuroticism. In so far that this profile shared strong similarities to a *healthy personality index* (Bleidorn et al., 2020), we labelled this class the Healthy climber. In contrast, class 2 (n = 56) displayed the highest scores on neuroticism and the lowest scores on the remaining big five domains. For these reasons, we labelled class 2 the Emotionally Unstable climber. Class 3 (n = 106) were characterized by displaying low-moderate scores on extraversion, neuroticism and openness to experience,

whilst displaying moderate-high scores on conscientiousness and agreeableness. We therefore labelled class 3 the Measured and Compliant climber, in line with consistently recognized facet descriptions of conscientiousness and agreeableness (Costa & McCrae, 1992; Goldberg et al., 2006). Conversely, class 4 climbers (n = 107) had relatively high scores on openness to experience, and moderate levels of extraversion and neuroticism, whilst displaying lower scores for conscientiousness and agreeableness in comparison to other profiles. We labelled class 4 the Curious and Impulsive climber on the basis that most models of openness to experience include curiosity-related facets (Silvia & Christensen, 2020), and impulsiveness seems to contain facets of both neuroticism and extraversion (Laborde et al., 2020) (for means and standard errors, please see Table 3).

Big Five Profile Differences in Sensation Seeking

MANCOVA showed significant differences between the four different profiles on sensation seeking, Pillai's Trace (12, 966) = 5.48, $p < .001$. Follow-up univariate tests confirmed differences between profiles for the following sensation seeking variables: thrill and adventure seeking, F (3, 323) = 2.74, $p < .05$, $\eta^2 = 0.02$; experience seeking, F (3, 323) = 19.86, $p < .001$, $\eta^2 = 0.15$; and, disinhibition, F (3, 323) = 5.38, $p < .001$, $\eta^2 = 0.05$. No significant differences between personality profiles and boredom susceptibility were found, F (3, 323) = 2.12, $p = .10$, $\eta^2 = 0.02$.

Post-hoc comparisons (with Hochberg adjustment) for personality profiles on sensation seeking subscales showed that for thrill and adventure seeking, Healthy climbers reported significantly higher scores than Emotionally Unstable climbers ($p = .05$). For experience seeking, five of the six post-hoc comparisons showed statistically significant differences (see Table 4). Healthy climbers had higher ratings for experience seeking than Emotionally Unstable ($p = .000$) and Measured and Compliant climbers ($p = .001$), respectively. Emotionally Unstable climbers showed lower scores for this variable than

Measured and Compliant (p = .04) and Curious and Impulsive climbers (p = .000), respectively. In addition, Measured and Compliant climbers reported lower experience seeking tendencies than Curious and Impulsive climbers (p = .000). For disinhibition, Curious and Impulsive climbers had significantly higher scores than Emotionally Unstable climbers (p = .01) and Measured and Compliant (p = .02) respectively. Finally, significant differences in sensation seeking were also found for sex as a covariate, Pillai's Trace (4, 320) = 7.28, $p < .001$. Follow-up univariate tests showed that males rated themselves higher than females for boredom susceptibility, F (1, 323) = 16.40, $p < .001$, $\eta^2 = 0.05$; experience seeking, F (1, 323) = 7.99, $p < .01$, $\eta^2 = 0.02$; disinhibition, F (1, 323) = 7.35, $p < .01$, $\eta^2 = 0.02$; and, thrill and adventure seeking, F (1, 323) = 10.18, $p < .01$, $\eta^2 = 0.03$.

Discussion

To our knowledge, this is the first study that has taken a person-centred approach to exploring whether distinct big five personality profiles could be identified among competitive climbers. Our findings identified four separate personality profiles: Healthy; Emotionally Unstable; Measured and Compliant; and Curious and Impulsive climbers. A second exploratory aim sought to examine whether these personality profiles would differ on sensation seeking tendencies. The findings showed significant differences between the personality profiles on three of the four sensation seeking subscales. The Healthy climbers displayed higher ratings on the thrill and adventure seeking, and experience seeking subscales in comparison to the Emotionally Unstable climbers, respectively. This represents an important finding since the Healthy profile shares a strong resemblance to a recently developed *healthy personality index*. This *healthy personality index* has been found to be positively correlated with psychological adjustment, self-esteem, self-regulation, immunity to stress, and an optimistic outlook (Bleidorn et al., 2020). This contrasts previously held views on sensation seeking whereby many of the subscales were considered to be indicative of

pathological functioning (Zuckerman, 1979).

In identifying different personality profiles, these findings help to suggest that higher scores on some sensation seeking subscales may be experienced by competitive climbers who display a healthy, normative personality profile in comparison to those who may not (i.e., Emotionally Unstable climbers). These profiles go some way to supporting theoretical assertions that sensation seeking may be driven by a hyperactive approach (Joseph et al., 2009) or hypoactive avoidance brain system (Zheng et al., 2019). In the presence of potential rewards and risks whilst climbing, approach systems may be expressed in the forms of greater openness to experience, extraversion, and conscientiousness, whilst avoidance systems may manifest themselves through greater expression of neuroticism than other personality domains. This could have important applied implications for providing new understanding on how coaches and practitioners could support climbing profile groups who may be more likely to avoid difficult maneuvers, or ‘freeze’ during climbing events.

In challenging the view that high-risk sport participants can be considered a homogenous sensation-seeking group regardless of adventure sport (Barlow et al., 2013), our findings extend current knowledge by illustrating how heterogenous personality profiles can exist within a single high-risk sport, and how these groups may report similar or different levels of sensation seeking. For example, the Healthy, and Curious and Impulsive groups showed no statistically significant differences in any of the sensation seeking subscales, whilst both reporting high scores for thrill and adventure seeking, and experience seeking.

When exploring the big five composition differences between the Healthy and Curious and Impulsive groups, it was observed that both profiles displayed similarly high levels of openness to experience, and moderate or high levels of extraversion. This would suggest that openness to experience is the most salient big five factor that determines high levels of sensation seeking in climbers, but the degree to which this is the case might also

depend on possessing a moderate or high level of extraversion, conscientiousness, and agreeableness (most likely in that order of importance). This is justified by psychology studies that have used relative weight analysis to demonstrate that openness to experience, extraversion, and conscientiousness contribute the most variance in sensation seeking, in comparison to agreeableness and neuroticism (de Vries et al., 2009). Moreover, in the current study, a comparison of the Healthy and Curious and Impulsive groups highlights that possessing moderate levels of neuroticism may not prevent climbers from enacting high sensation seeking. Rather, it is the amalgamation of neuroticism with moderate-to-high levels of extraversion and openness to experience that seems to be associated with higher sensation seeking tendencies. From an applied perspective, these nuanced profile differences between the Healthy and Curious and Impulsive groups could be highly visible for coaches to identify during training, or referees and spectators at competitive events. This is because the moderate neuroticism that the Curious and Impulsive group display could manifest itself by way of poorly timed decision making in dangerous climbing circumstances, or fear and panic following a spontaneous decision. From a theoretical perspective, the Curious and Impulsive group and their subsequent behaviors could sit somewhere in between a hyperactive and hypoactive avoidance system of sensation seeking during competitive events.

Our findings also extent current knowledge on person-centred approaches to understanding personality differences in sensation seeking-related behaviors. In a study by Castanier et al. (2010b), the authors examined personality differences in risk-taking behaviors across various high-risk sports. Their cluster analysis findings showed that risk-taking behaviors, such as experiencing frequent accidents due to irresponsible behavior, and taking too many risks when practicing high-risk sports, were the highest in groups displaying low conscientiousness, and high or low combinations of extraversion and neuroticism. These risk-taking behaviors share some similarities to items from the thrill and adventure seeking

subscale of sensation seeking (e.g., “I can’t understand people who risk their necks climbing mountains”). From an applied perspective, this person-centred approach provides an advantage over variable-centred techniques (e.g., regression) in identifying subgroup profiles from a sampled population that could lead to tailored subgroup interventions. The Castanier et al. (2010b) study, however, did not examine group membership of all five personality domains, nor was it clear how participants were reliably assigned to group memberships for high / low profiles of conscientiousness, extraversion, and neuroticism in specific sports. Using a latent profile analysis, we extend these findings by reliably demonstrating the importance of identifying different big five profiles containing high levels of openness to experience in predicting high sensation seeking. We also highlight that high levels of sensation seeking can be seen in groups displaying moderate to high levels of conscientiousness and agreeableness as well, particularly when accompanied by high levels of extraversion.

Applied Recommendations

The findings of the present study have important applied implications for coaches and sport psychologists working with competitive climbers, because they suggest that different personality profiles may be able to distinguish between higher and lower degrees of sensation seeking. From a theoretical standpoint, this may suggest that some climbers could have a greater tolerance to how they approach or avoid potential risks and rewards from participating in this adventure sport (Joseph et al., 2009; Zheng et al., 2019). Identifying how an individual’s personality profile is linked to one’s sensation seeking tendencies in climbing could provide greater understanding of how training interventions could be promoted to improve safety education. For example, training could look to reinforce one’s perception of negative consequences. This approach could be suitable for specific groups (e.g., a Curious and Impulsive profile) who may lack inhibition from completing risky maneuvers, or lack an

ability to sensibly comply with regulating their activation of dangerous activities.

Furthermore, knowledge of subgroup personality profile differences could lead to developing cognitive-behavioral programs designed to improve one's perception of reward/gain. Such an approach could be appropriately shaped for specific groups (e.g., an Emotionally Unstable profile) who may be more hesitant and 'freeze' on a climbing wall when completing potentially threatening maneuvers. Taken together, coaches and psychologists could seek to establish the profiles of novice sportspersons and then seek to tailor their training experiences accordingly. In the context of the present findings, coaches could look to offer Curious and Impulsive climbers a more expansive range of experiences (aligned to greater disinhibition) than Measured and Compliant climbers. The longer-term effects of such an approach could then be examined in relation to climbers' enjoyment and engagement over time.

Limitations and Future Research

First, latent profile analysis was conducted on the big five personality *domains*. Although sport and exercise psychology researchers often examine the FFM domains in relation to various well-being and performance outcomes (Allen et al., 2020; Rumbold et al., 2020), an examination at the *facet* level may provide a more nuanced explanation of how personality profiles are linked to sensation seeking tendencies or other outcome variables in the future (Laborde et al., 2020). Second, we acknowledge the limitation of sampling one sport, which prevents generalizability to other adventure sports. Future research could seek to apply a latent profile analysis to other adventure sports to determine whether similar personality profiles emerge. This is particularly important in light of evidence that comprehensively challenges the view that high-risk sport participants can be considered a homogenous sensation-seeking group (Barlow et al., 2013). Third, we agree that research on personality in sport and physical activity needs to transition away from cross-sectional

designs (Allen et al., 2020; Laborde et al., 2020). For example, researchers could longitudinally examine how participation in sport and exercise might contribute to stability or change in personality. In addition, prospective designs could be used to assess how personality traits may explain changes in people's enjoyment of sport and physical activities (Jackman et al., 2020). Our findings would also suggest that it may be worthwhile to continue to examine gender differences in future work when examining sensation seeking-related experiences over time. Although our findings support previous research that has identified sex differences in sensation seeking tendencies (e.g., Cross et al., 2013; Zuckerman et al. 1978), other research suggests that this may not always be the case (e.g., McEwan et al., 2019). Finally, we acknowledge that the sensation seeking scale (SSS V; Zuckerman, Eysenck, & Eysenck, 1978) adopted in this study does not imply that sensation seeking is a motive for participation in high-risk sports (Woodman et al., 2020). It was not our intention in this study to assess sensation seeking as a proxy for motives for participation in competitive climbing, however, future research could look to adopt a person-centred approach in identifying variance in participation motives within and between high-risk sports.

Conclusion

In summary, the findings of this study contribute to an in-depth understanding of individual differences in relation to sensation seeking tendencies in the specific high-risk sport of competitive climbing. The latent profile analysis approach provided a reliable way of differentiating between big five personality profile memberships, and enabled us to demonstrate that various combinations of the big five seem to provide greater examples of high sensation seeking tendencies in this climbing sample than others. Continuing with a person-centred approach towards personality research in the future may be useful in developing individually tailored interventions to engage people in particular sport activities safely, and, to optimize their experience in a healthy and personally meaningful way.

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Table 1. Descriptive statistics, coefficient alphas, bivariate and biserial correlations of the study variables (N = 331)

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Extraversion	3.24	0.72	(.87)										
2. Neuroticism	2.65	0.81	-.34	(.87)									
3. Conscientiousness	3.47	0.64	.25	-.35	(.79)								
4. Agreeableness	3.74	0.50	.14	-.21	.29	(.72)							
5. Openness to new experience	3.82	0.60	.40	-.10	.07	.13	(.75)						
6. Thrill and adventure seeking	7.48	1.89	.20	-.15	-.03	-.03	.11	(.97)					
7. Experience seeking	5.58	1.71	.30	-.14	-.10	.01	.39	.18	(.71)				
8. Disinhibition	4.53	1.66	.21	.02	-.12	.12	.08	.19	.33	(.96)			
9. Boredom susceptibility	2.96	1.75	.20	-.03	-.20	-.37	-.02	.16	.16	.29	(.71)		
10. Total sensation seeking	20.55	4.50	.35	-.12	-.17	-.19	.22	.62	.64	.69	.62	-	
11. Sex	1.49	0.50	.03	.19	.05	.18	.09	-.14	-.12	-.14	-.19	-.27	-

Note. Sex was coded as ‘1’ for males and ‘2’ for females. Cronbach’s alpha coefficients for each subscale are presented in parentheses. Coefficient values >.11 = $p < .05$; Coefficient values > .14 = $p < .01$. Underlined coefficients indicate a non-significant relationship.

Table 2. Table of model fit statistics and profile membership distribution for the big five personality domains

Model	Fit statistics				Profile Membership Distribution				
	BIC	SSABIC	BLRT	Entropy	1	2	3	4	5
One-profile	3306.898	3275.177	N/A	N/A					
Two-profile	3209.666	3158.913	-1624.438***	0.582	145	186			
Three-profile	3216.443	3146.658	-1558.416***	0.572	108	59	164		
Four-profile	3219.219	3130.402	-1544.398***	0.616	62	56	106	107	
Five-profile	3238.219	3130.370	-1528.380^{ns}	0.659	114	55	91	64	7

Note. N = 331. *** = $p < .001$; ^{ns} = non-significant, $p > .10$.

Table 3. Means and standard errors of the four big five personality latent profiles (N = 331)

	Class 1 Healthy (n = 62)		Class 2 Emotionally Unstable (n = 56)		Class 3 Measured and Compliant (n = 106)		Class 4 Curious and Impulsive (n = 107)	
	M	SE	*M*	SE	*M*	SE	*M*	SE
EXT	3.910	0.150	2.452	0.089	3.080	0.145	3.357	0.132
NEU	1.951	0.163	3.498	0.177	2.261	0.126	3.052	0.140
CON	3.892	0.116	3.043	0.118	3.678	0.101	3.210	0.132
AGR	3.968	0.083	3.476	0.072	3.815	0.091	3.659	0.099
OPE	4.253	0.128	3.260	0.126	3.479	0.124	4.160	0.058

Note. EXT = Extraversion; NEU = Neuroticism; CON = Conscientiousness; AGR = Agreeableness; OPE = Openness to experience.

Table 4. Description of the four latent class (N = 331) differences in sensation seeking subscales

	Class 1 Healthy (n = 62)		Class 2 Emotionally Unstable (n = 56)		Class 3 Measured and Compliant (n = 106)		Class 4 Curious and Impulsive (n = 107)		Post-hoc comparisons
	M	SE	*M*	SE	*M*	SE	*M*	SE	
Thrill and adventure seeking	7.920	0.236	6.972	0.248	7.399	0.185	7.589	0.180	a
Experience seeking	6.181	0.201	4.512	0.210	5.144	0.157	6.211	0.153	abdef
Disinhibition	4.589	0.206	4.111	0.216	4.215	0.161	4.988	0.157	ef
Boredom susceptibility	3.076	0.218	2.903	0.228	2.621	0.170	3.200	0.166	

Note. a = class 1 differs from class 2; b = class 1 differs from class 3; c = class 1 differs from class 4; d = class 2 differs from class 3; e = class 2 differs from class 4; f = class 3 differs from class 4. Standard errors and post-hoc comparisons are based on 95% bias-corrected bootstrapped estimates.

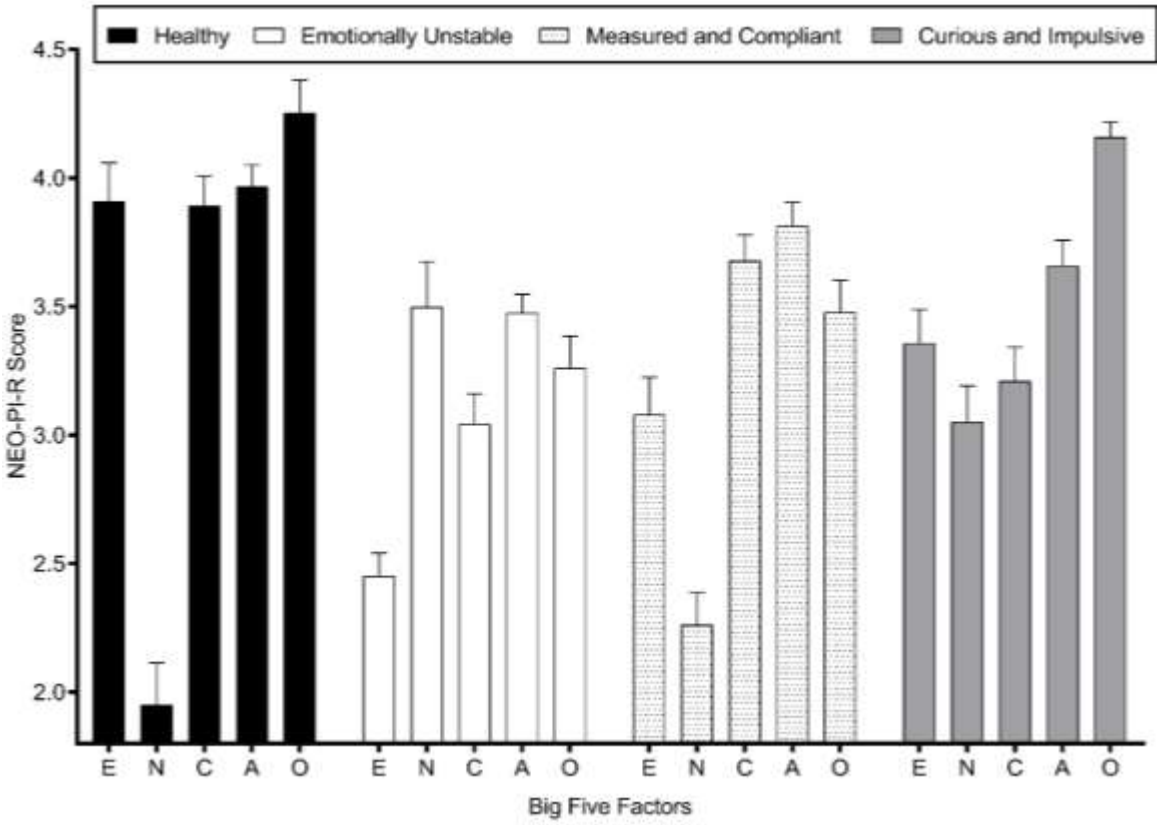

*Figure 1***.** The four personality profiles by Big Five factors. *Note.* E = Extraversion, N = Neuroticism, C = Conscientiousness, A = Agreeableness, O = Openness to experience.