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Abstract

In recent years, research on high-risk athletes has focused mainly on personality traits, highlighting a complex and often ambivalent personality structure. Although scholars pointed out emotional difficulties amongst high-risk athletes, there exists to this day no in-depth investigation of the affective aspect. In an effort to address this so-far neglected question, this study offers the first thorough exploration of patterns of romantic relationships among high-risk athletes. Two groups were selected: people who practice extreme sports (N = 189; Extreme) and those who practice other types of sports (N = 207; Non-extreme). A series of tests were administered to evaluate romantic love, personality traits and self-esteem. Results showed that Extreme tend to display less intense feelings than their Non-extreme counterparts; conversely, their sentimental relationships are characterized by positive emotions and stable feelings, avoiding negative emotions. Hence, despite stereotypes which characterize Extreme as thrill-seekers prone to impulsivity, it seems that this group do not in fact seek as many thrills in their love life, but rather seek stability and contentment. Although still in its explorative phase, this study produced preliminary data which should be considered in devising further assessment and therapeutic strategies for this population of athletes.

Keywords

Affect, emotion, extreme sports, personality, self-esteem

Introduction

Individuals who choose to participate in extreme sports, such as bungee jumping and skydiving, often risk their lives to experience a few seconds of stomach-dropping thrill.¹ Typically, high-risk sports, compared to other sports, involve both high levels of excitement and medium to high levels of risk.^{2–6} So far, the majority of scientific research concerned with extreme sports has focused on the personality traits of high-risk athletes (for review McEwan et al.⁷). Overall, these studies offer a complex view of those types of athletes. On the one hand, early research defined high-risk athletes as sensation-seekers^{8–10} characterized by impulsivity, disinhibition and a greater-than-average susceptibility to boredom.¹¹ On the other hand, more recent studies have nuanced old beliefs about the self-destructive nature of these activities, unveiling unexpected personality profiles as well as benefits associated with this type of sport. Several of those studies have shown that high-risk

athletes display higher levels of emotional stability,^{12–14} extraversion,^{12,15} conscientiousness,¹³ self-esteem and self-confidence¹⁶ than athletes who practice more conventional sports. Furthermore, high-risk sports could have a prophylactic effect on antisocial behavior and criminal tendencies

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among teenagers,¹⁷ whilst contributing to the development of values such as humility and courage among participants.¹⁸ The stereotypes linking high-risk athletes to self-involved personality traits appear outdated; research indicates that they can and should be nuanced.

Although the personality types of high-risk athletes have been investigated for decades (e.g. Ross et al.¹⁹), little has yet been undertaken to throw light upon other psychological and affective aspects they might have in common. Recently a study comparing the attachment styles of those who practice extreme sports with those who do not has revealed that high-risk athletes are less prone to anxious and avoidant attachment styles.²⁰ Yet, despite showing a tendency to develop secure attachment styles, the same study has also found that high-risk athletes have a low emotional awareness.²⁰ Some authors,¹⁶ attribute this lack of awareness to the fact that people who practice extreme sports are often subject to conflicting emotions at the same time (pleasure-pain, risk-safety, arousal-calm). Others instead assume that dedication to extreme activities can be viewed as a way to regulate emotions which they would not otherwise be able to express.^{21–25} Authors have suggested that this difficulty in regulating emotions manifests itself more prominently in interpersonal relationships and especially in those which require a strong emotional involvement, such as romantic relationships.²⁶ This hypothesis had previously been foregrounded in a past study in which seventeen extreme climbers chosen for an Everest expedition indicated that they perceived relationships as stressful.²⁷ Despite the fact that these studies have thrown light upon a very important aspect relating to the elaboration of emotion and romantic relationships among extreme sports practitioners, no one has so far ventured an explanation. Therefore, on this basis, the main aim of this study is to fill this gap in the literature and investigate the patterns specific to the sentimental relationships of extreme sports enthusiasts. To accomplish this goal, we compared two groups of athletes: on the one hand, those who practice high-risk sports (Extreme) and on the other hand, those who train in more traditional sports (Non-extreme). We administered a series of tests to assess responses to romantic love, in its multidimensional nature. Considering the extensive literature on romantic love and its many definitions, for this study we wanted to refer to constructs about love derived from the field of neuroscience. Romantic love, which has long been held to be a pure emotion, has recently been revealed to be rather a goal-directed mechanism which combines cognitive and emotional processes^{28–30} and personality.³¹ It mobilizes attachment,³² sexual attraction,^{33,34} positive as well as negative emotions, obsessive thoughts (typical of passionate love), and idealization.^{30,31} Although more studies are needed to confirm a direct association between romantic love and personality traits (e.g. Heaven et al.³⁵; Wan et al.³⁶) and self-esteem,³⁷ given the peculiarity of this

type of athletes, and considering that personality traits are stable and influence the tendency to display thoughts, feelings and behavior,³⁸ we also tested personality and self-esteem to include these variables as a control.

Since it is as yet unique, this study therefore remains exploratory for want of comparative material. However, several studies in the field of romantic relationships allow us to make some conflicting assumptions. For example, if the impulsive and susceptible to boredom side predominates, we could expect short romantic relationship and love profiles characterized by negative feelings and obsessive behaviors typical of pathological love.³⁹ On the contrary, if the side characterized by secure attachment and emotional stability predominates, we can expect stable romantic relationships made of positive emotions and positive idealization.⁴⁰ This work represents, to our knowledge, the first study to investigate romantic love relationships among high-risk sports athletes.

Method

Participants

Participants were recruited from different parts of Italy via an online survey system (LimeSurvey GmbH). Multiple recruitment strategies were used either online (emails, Facebook pages and groups), via printed media, and through word of mouth. To be eligible for this study, participants had to meet the following criteria: (1) they must be involved either in Extreme or Non-extreme sport activities and (2) currently involved in a romantic relationship, regardless of their gender identity and sexual orientation. In this study, sports were listed as high-risk when they conformed to Brymer and Oades's¹⁸ definition of extreme sports as physical pursuits in which an accident or mistake was likely to have a fatal or near-fatal outcome. Participants involved in extreme activities practiced different kinds of sports such as base jumping, body board, bungee jumping, downhill skiing, free climbing, freestyle skiing, freeride skiing, hang gliding, helisking, kitesurf, parachuting, paragliding, rafting, rally, skydiving, snowboarding, windsurf and wingsuit. Non-extreme participants were involved in sports such as football, working out, yoga, road cycling, swimming, pilates, basketball, aerobics, tennis, functional training and crossfit.

Out of the 476 individuals who expressed interest in the study, 80 were not involved in any kind of relationship and were therefore not included. The final sample consisted of 396 participants, of which 189 were labeled Extreme ($n = 65$ women, 34%; $n = 124$ men, 66%), and 207 Non-extreme participants ($n = 122$ women, 59%; $n = 85$ men, 41%). Regarding education, 85% of Extreme and 87% of Non-extreme participants had at least a high-school education, and the remaining 15% for the Extreme and 13% for Non-extreme subjects had a middle-school diploma.

Table 1. Summary of between-group differences in terms of relationship status and lengths of relationships (expressed in months).

Variables	Non-extreme	Extreme
Relationship status	N (%)	N (%)
Dating regularly	80 (38.65)	67 (35.44)
Engaged	98 (47.23)	86 (46.03)
Only sexual relationship	5 (2.45)	10 (4.76)
Married	24 (11.65)	26 (13.75)
Length of relationship	M (SD)	M (SD)
Dating regularly	10.5 (16.9)	11.3 (19.9)
Engaged	38.0 (41.3)	52.7 (39.8)
Only sexual relationship	8.00 (4.90)	17.3 (34.2)
Married	129 (141)	145 (100.0)

Note: % represents the percentage of the sample; N the number; M represents mean scores and SD standard deviations.

The average age of the Extreme groups was ($M = 33.6$, $SD = 9.19$), and for Non-extreme was ($M = 30.1$, $SD = 8.84$). Moreover, most of the Extreme practiced more than one extreme sports intensively and the 30% of the sample were involved in agonistic activities. The two samples were similar in terms of relationship status and lengths of relationships (see Table 1). The research protocol was approved by the [blinded for review]'s research ethic board.

Procedures

Participants were recruited either from the Psychology Department at the University of [blinded for revision] and sports clubs. The study was conducted using LimeSurvey, an open-source survey tool that uses online forms. Interested participants provided their informed consent, and those eligible were automatically directed to complete the online survey. The questionnaires (described below) were presented randomly to ensure there were no order effects. The average time to complete the form was about 20 min.

Measures

Multidimensional evaluation of love (MEVOL). The MEVOL³¹ was administered to measure several dimensions of romantic love. The MEVOL is a self-report questionnaire comprising 21 items, reflecting seven categories (3 items per subscale). The subscales reflect: (1) *positive idealization*, which is the tendency to exaggerate the qualities of another person as if that person were perfect (e.g. "He/She represents what I always wanted"); (2) *negative idealization*, which implies a devaluation of the self which leads to an indirect enhancement of the partner (e.g. "Sometimes I feel I am emotionally more fragile than him/her"); (3) *sexual attraction*, which refers to sexual desire and sexual excitement toward a partner (e.g. "I'm very sexually

attracted to him/her"); (4) *positive* and (5) *negative emotions* which refer to the levels of positive and negative feeling which partners experience during love-based or amorous relationships (e.g. "He/She makes me feel safe; Sometimes I'm afraid that may he/she cheat on me"); (6) *obsessive thinking* which refers to intrusive thoughts or actions that are obsessively focused on the partner (e.g. "I obsessively check the phone with the hope that he/she will contact me"); and (7) *taking love for granted* which refers to the feeling of being excessively certain of the partner's love (e.g. "I think he/she likes me too much"). Items are rated on a 6-point scale ranging from 1 (*not at all true*) to 6 (*definitely true*). In the Italian version of MEVOL's subscales,³¹ alpha coefficient were .76 for positive idealization, .68 for negative idealization, .72 for sexual attraction, .71 for taking love for granted, .70 for positive emotions, .66 for negative emotions, and .65 for obsessive thinking. The internal consistency coefficients of the subscales in the present sample are within the acceptable reliability limits (positive idealization = .71; negative idealization = .75; sexual attraction = .77; taking love for granted = .70; positive emotions = .72; negative emotions = .70; obsessive thinking = .73).

Passionate love scale (PLS-R-It). This scale, developed by Hatfield and Sprecher,³⁰ was used to measure passionate love in a one-dimensional way. For this study we used the Italian reduced version⁴¹ composed of 15 items (e.g. "I would feel deep despair if he/she left me."). PLS-R-IT is a 9-point Likert type scale, and response alternatives range from 1 (*not at all true*) to 9 (*definitely true*). Scores from the PLS-R-IT have been shown to be reliable (Cronbach's $\alpha = .91$; Cannas Aghedu et al.⁴¹). In the current samples, internal consistency for the PLS-R-IT was .91.

Rosenberg's self-esteem scale. This scale was developed by Rosenberg⁴² to measure individual self-esteem by asking the participants to reflect on their current feelings about themselves. For this study we used the Italian version⁴³ composed of 10 items (e.g. "On the whole, I am satisfied with myself") scored on a 4-point Likert scale ranging from 1 (I strongly disagree) to 4 (I strongly agree). Higher scores indicate higher self-esteem. The Italian version of this measure has been shown to be reliable (Cronbach's $\alpha = .84$; Prezza et al.⁴³). In the present study, the internal consistency reliabilities of the scale as calculated by Cronbach's α were .89.

Ten-item personality inventory (I-TIPI-R). The TIPI-R developed by Gosling et al.⁴⁴ is one of the shortest validated instruments to measure personality traits following the Big Five theory. For this study we used the Italian validation (I-TIPI-R; Chiorri et al.⁴⁵). I-TIPI-R is a 10-item scale consisting of 5 subscales (2 items per subscale),

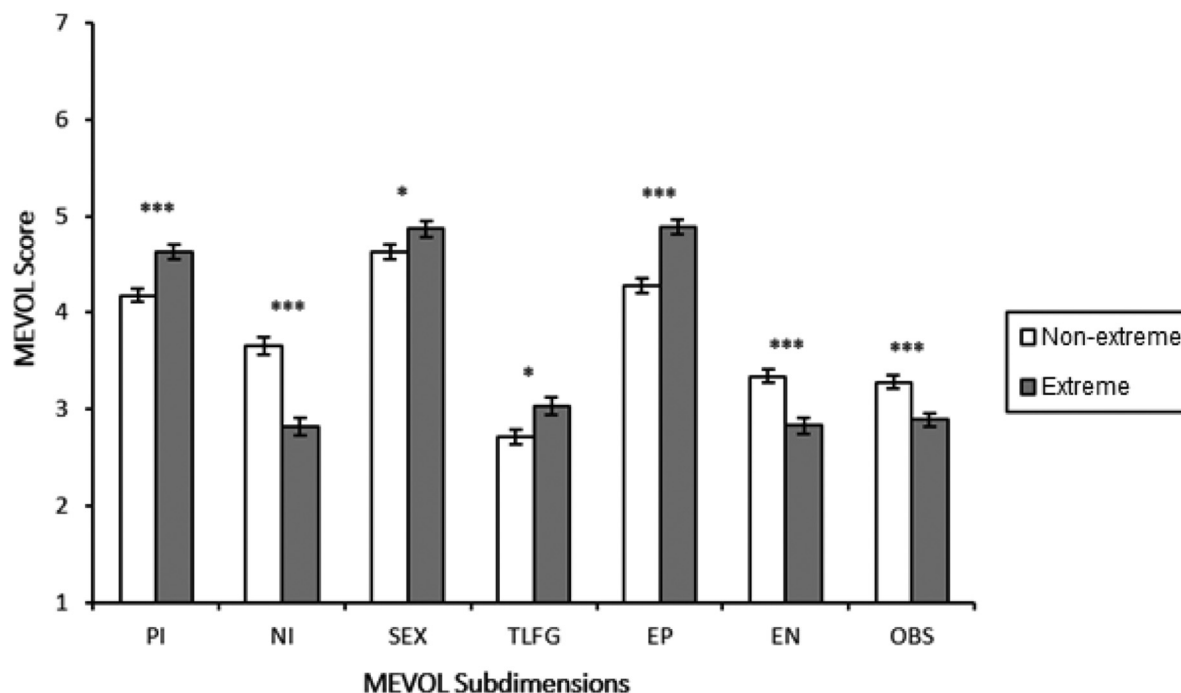


Figure 1. MEVOL mean subscores by group. PI=Positive Idealization, NI=Negative Idealization, SEX=Sexual Attraction, TLFG=Taking Love For Granted, EP=Positive Emotions, EN=Negative Emotions, OBS=Obsessive Thinking. * $p < .05$, *** $p < .001$.

namely Extraversion (e.g. “I see myself as extraverted, enthusiastic”), Agreeableness (e.g. “I see myself as sympathetic, warm”), Conscientiousness (e.g. “I see myself as dependable, self-disciplined”), Emotional Stability (e.g. “I see myself as calm, emotionally stable”), and Openness to Experience (e.g. “I see myself as open to new experiences, complex”). I-TIPI-R is a 7-point Likert type scale and the response alternatives range from 1 (*I strongly disagree*) to 7 (*I strongly agree*). The original TIPI-R⁴⁴ showed low-to-moderate Cronbach’s alphas, which is a typical finding in short scales.⁴⁶ In the Italian version of I-TIPI-R alpha coefficients were .58 openness to experience, .67 conscientiousness, .72 extraversion, .38 agreeableness, .50 and emotional stability. In the present study, the internal consistency reliabilities values for each sub-scale were .48 openness to experience, .46 conscientiousness, .79 extraversion, .96 agreeableness, .50 emotional stability.

Results

Descriptive statistics

Prior to our hypothesis testing, a series of Student *t*-tests was conducted. As can be seen in Table 2, the groups (Non-extreme and Extreme) significantly differed on the main study variables. Specifically, every characteristic differed but Conscientiousness and Agreeableness at the $p = .006$ threshold (Bonferroni correction for 8 *t*-tests). The patterns of personality characteristics among Extreme

in our sample echoed those found in previous studies (e.g. Castanier et al.¹²; Rhea & Martin¹⁴). Finally, a Chi-Square test revealed that groups were unbalanced in terms of sex distribution (Proportion of female, $F_{\text{Extreme}} = 41.1\%$; $F_{\text{Non-extreme}} = 58.9\%$; $\chi^2(2) = 24.55$, $p < .001$), which means Gender would also have to be checked as a potential confound later on.

MEVOL. Since population characteristics were deemed adequate, we proceeded to the exploration of the link between Extreme profiles and romantic relationship profiles. A One-Way MANOVA model was conducted with our two groups as the fixed factor and MEVOL’s seven dimensions as the dependent variables. The overall model was significant, $F(8, 387) = 9.04$; $p < .001$ $\eta^2 = .16$, which suggests that the two groups showed differences in MEVOL’s categories scores. Groups differed on every MEVOL dimension but Sexual Attraction and Positive Idealization (see Table 3), with Extreme reporting higher Positive Emotions, taking love for granted more often, while displaying lower Negative Idealization, Negative Emotions and Obsession.

When re-running the model with Age, Gender and PLS-R-IT as covariates, all effects remained globally the same, with a significant overall model, $F(8, 384) = 6.90$; $p < .001$ $\eta^2 = .13$, excluding the possibility that these factors might be confounds (see Figure 1). However, the effect of group type upon Sexual Attraction and Positive Idealization became significant; with respectively

Table 2. Summary of between-group differences in terms of age, PLS-R-IT, self-esteem and big-five traits (student t-tests, N = 396).

Variables	Non-extreme N = 207 (SD)	Extreme N = 189 (SD)	t-value (Df = 394)	Significance (p)	Effect size (d)
Age	30.39 (8.83)	33.59 (9.19)	3.53*	<.001	.36
PLS-R-IT	98.27 (23.96)	90.88 (23.92)	3.07*	.002	.31
Self-Esteem	27.04 (6.09)	31.37 (5.00)	7.70*	<.001	.78
<i>Big-Five Traits</i>					
Openness	8.82 (2.85)	10.62 (2.21)	6.97*	<.001	.70
Conscientiousness	9.76 (2.79)	10.03 (2.39)	1.02	.31	.10
Extraversion	7.28 (4.31)	9.08 (2.52)	5.03*	<.001	.51
Agreeableness	8.64 (3.50)	9.03 (3.59)	1.11	.27	.11
Emotional Stability	6.63 (2.92)	9.17 (2.78)	8.83*	<.001	.89

Note. For all groups, numbers represent mean scores and those between brackets represent standard deviations. * $p < .006$.

Table 3. MANOVA model of group type impact upon the seven MEVOL scores (N = 396).

MEVOL Scores	Non-extreme N = 207 (SD)	Extreme N = 189 (SD)	Fisher F(1, 394)	Significance (p)	Effect size (η^2)
PI	4.31 (1.30)	4.50 (1.18)	2.34	.13	.01
NI	3.75 (1.45)	2.66 (1.28)	61.50***	<.001	.14
SA	4.74 (1.40)	4.72 (1.24)	.03	.87	.00
TLFG	2.69 (1.23)	2.99 (1.26)	5.70*	.017	.01
PE	4.34 (1.18)	4.84 (1.99)	20.12***	<.001	.05
NE	3.44 (1.39)	2.71 (1.29)	29.71***	<.001	.07
OT	3.43 (1.35)	2.69 (1.27)	31.87***	<.001	.08

Note. PI = Positive Idealization, NI = Negative Idealization, SA = Sexual Attraction, TLFG = Taking Love For Granted, PE = Positive Emotions, NE = Negative Emotions, OT = Obsessive Thinking. * $p < .05$, *** $p < .001$.

$F(1, 391) = 4.28$; $p = .039$ $\eta^2 = .01$ and $F(1, 391) = 20.33$; $p < .001$ $\eta^2 = .05$. Extreme displayed higher scores on both measures (Table 4).

Positive perspective taking. Because the main point of MEVOL is the addition of a perspective taking dimension, we wanted to assess the extent to which groups differed on this factor. We therefore reverse-coded Negative Perspective Taking items and aggregated them with Positive Perspective Taking ones. The reliability was adequate (Cronbach's $\alpha = .76$) and allowed us to compute a single score of Positive Perspective Taking. When then ran a one-way ANCOVA which yielded a significant effect of Group upon Positive Perspective Taking, $F(1, 394) = 46.06$; $p < .001$ $\eta^2 = .11$, which held even when adding age, gender and PLS-R-IT as covariates $F(1, 391) = 37.66$; $p < .001$ $\eta^2 = .09$. Extreme were capable of more Positive Perspective Taking ($M = 4.57$, $SD = 1.10$) than Non-extreme ($M = 3.73$, $SD = 1.33$).

Discussion

This study is the first to explore the sentimental relationships of a group of high-risk sports athletes. Moreover, some aspects related to personality traits and self-esteem were also taken into account for the investigation. The

first main finding was that, compared to the Non-extremes, the Extremes reported a significantly lower level of passionate love as measured by the PLS-R-IT; they scored significantly high in the MEVOL's categories of positive idealization, sexual attraction, taking love for granted, positive emotions and positive perspective taking. These results suggest that Extremes seem to prefer relationships which are characterized by less intense feelings but by high sexual attraction and positive emotions for the partner whom they perceive always to be present and in love (positive perspective taking). This effect is in line with previous studies²⁶ which demonstrated that Extremes tend to avoid intense and negative emotions in relationships as they are perceived as stressful. Another possible explanation could be related to attachment style, as foreshadowed in previous studies in which Extremes displayed more secure attachment compared to Non-extremes.²⁰ In this sense, researchers who have conceptualized romantic love as an attachment process^{47,48} have shown that securely attached individuals perceived their love experiences to be "friendly, happy, and trusting" (Shaver & Hazan⁴⁸, p. 518). However, this interpretation is for speculative purposes only, as the attachment styles were not measured in this study and therefore conclusions are based on indirect inferences.

Another interesting result is that Extremes scored significantly lower in the MEVOL's categories, such as negative

Table 4. MANOVA model of group type impact upon the seven adjusted MEVOL scores (N = 396).

MEVOL scores	Non-extreme N = 207 (SE)	Extreme N = 189 (SE)	Fisher F(1, 391)	Significance (p)	Effect size (η^2)
PI	4.18 (.07)	4.63 (.07)	20.33***	<.001	.05
NI	3.66 (.09)	2.82 (.09)	44.83***	<.001	.10
SA	4.63 (.07)	4.87 (.08)	4.28*	.039	.01
TLFG	2.71 (.08)	3.03 (.09)	5.54*	.019	.01
PE	4.28 (.07)	4.89 (.08)	30.26***	<.001	.07
NE	3.34 (.07)	2.83 (.08)	19.83***	<.001	.05
OT	3.28 (.07)	2.89 (.07)	15.45***	<.001	.04

Note. PI = Positive Idealization, NI = Negative Idealization, SA = Sexual Attraction, TLFG = Taking Love For Granted, PE = Positive Emotions, NE = Negative Emotions, OT = Obsessive Thinking. * $p < .05$, *** $p < .001$.

idealization, negative emotions and obsessive thinking. Therefore, Extremes seem to have less intrusive thoughts about their partner and are less involved in romantic relationships which lead to negative emotions. Thus, this study of the romantic relationships of Extremes debunks the negative stereotypes related to sensation seekers: Extremes do not tend to develop pathological romantic relationships despite often being prone to boredom and impulsivity.^{11,49,50}

Regarding the investigation of personality traits, our results clearly confirm previous literature, showing that the Extremes displayed a greater level of openness, extraversion, and emotional stability^{12–14,51} compared to the Non-extremes group. Moreover, as hypothesized by,¹⁶ this study shows that Extremes have higher levels of self-esteem compared to the Non-extreme group. These two findings regarding personality and self-esteem are in line with previous theories which established a solid correlation between the basic personality profile traits of individuals with high and low self-esteem.⁵² The authors, based on a large heterogeneous group of more than 300,000 individuals, demonstrated how basic personality profiles characterized mainly by extraversion, emotional stability and openness to new experiences are considerably correlated to high levels of self-esteem.

Overall, this data offers a new overview of the psycho-affective aspects of people who participate in extreme sports. Although previous personality studies had partly debunked the negative stereotypes attributed to Extremes,^{7,20} this study highlights a way of loving which is anything but negative. Indeed, it would seem that the ambivalence discussed in the literature¹² is extremely context-dependent. On the one hand, these people risk their lives for a few minutes of euphoria, and seek ever more intense, impulsive and uninhibited emotions; on the other hand, their sentimental sphere seems to be characterized not by intensity but rather by positive emotions and reciprocity. Yet, in the absence of other studies in this topic it is difficult to contextualize some effects size.⁵³ The large effects size might suggest that certain dimensions of MEVOL (e.g. positive emotion and negative

idealization) are important in distinguishing Extremes and Non-extremes. However, they might also suggest the presence of third variables that might inflate the relationship between MEVOL's categories and extreme sports.

Future studies should include sensation-seeking and relationship satisfaction levels as a variable of investigation. Moreover, it would be interesting to see whether a link can be made between their preference for stable, reciprocal relationships—which therefore prevents situations such as obsessive love or troubled love—and their lack of ability to manage intense emotions in relationships, as assumed by some authors.^{26,54} In addition, studies suggested that the practice of extreme sports may constitute an avoidance strategy, to divert negative emotions and soften intense ones through physical exertion. Therefore, would be interesting to investigate the frequency of sporting activity in people who are involved in romantic relationships in the early stages, when emotions are typically intense. Another aspect to be explored could be to assess the relationship from the point of view of the partner in order to have a more complete and therefore more informative framework. Future studies should also consider the implementation of behavioral measures, where possible, and use these preliminary data to set up experimental research. Also, comparisons with non-athletes (i.e. general population) should be considered in order to facilitate the interpretation of the results.

Some limitations of this study must be mentioned. First, the nature of this study, which is exploratory, means that the interpretations are only speculative. Second, the MEVOL represents a novel measure, and therefore, there is no literature against which to compare the findings. Third, the level of sensation-seeking has not been examined. Fourth, the cross-sectional design of the study is a limitation since it does not allow for causal inference; moreover, also social desirability bias must be considered. To the best of our knowledge, this study was the first specifically to consider how a particular population, such as the Extremes, loves others in a romantic fashion. This study could reveal a fruitful avenue of investigation focused on understanding more about Extremes and their romantic relationships.

Some clinical implications can be addressed to this study. For example, clinical sport psychologists may attend to Extremes dealing with romantic troubles because of difficulties in managing intense emotions. If these occur, therapists would be able to adopt specific protocols oriented towards emotion regulation strategies. Conversely, couples therapists working with high-risk athletes could opt for a multidimensional assessment that would evaluate not only their patients' romantic aspects but also their personality and attachment aspects. This could serve as a basis for setting up a psycho-educational program to increase emotional awareness. For example, we can imagine that the lower intensity of passionate love in extreme sports people could represent a problem in some partners, especially in younger ones who are more prone to more intense relationships (see Hatfield & Sprecher³⁰). In this sense, both partners could benefit from psycho-education which would increase emotional reactivity by facilitating accessibility and security in the relationship.

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