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SOME PSYCHOLOGICAL STUDIES OF HIGH RISK SPORTS

NEKATERE PSIHOLOŠKE ŠTUDIJE RIZIČNIH ŠPORTOV

Abstract

This article attempts to present some psychological studies of high risk sports and athletes that engage in them on a top level. We define high risk sports as »any sport where one has to accept a possibility of severe injury or death as an inherent part of the activity« (Breivik, 1995), the reviewed studies present the personality and sensation seeking characteristics of high risk sports athletes. We define the sports that can be classified into this category of sports, deal with the term used to describe these sports, and also present the findings of existing international studies of these sports and two studies conducted on Slovene sample. In addition, we present which findings are confirmed by several studies (the most common finding is that high risk sports athletes are high sensation seekers and most studies find them to be extraverted) and which findings are contradictory (contradictions often refer to whether we can study all high risk sports athletes as one homogenous group or should rather separate them according to specific sports). We also elaborate on methodological aspects (low number of participants, few studies with female participants) of the reviewed studies and some other problems, and suggest some aspects for further research.

Key words: high risk sports, extreme sports, high risk sports athletes, personality, sensation seeking

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Izvleček

V članku poskušamo prikazati nekatere psihološke študije rizičnih športov in športnikov, ki se z njimi ukvarjajo na vrhunskem nivoju. Rizične športe smo definirali kot »športe, pri katerih je potrebno računati z možnostjo hujše poškodbe ali smrti, ki sta sestavni del aktivnosti« (Breivik, 1995), pregledane študije pa predstavljajo predvsem raziskave osebnosti in potrebe po dražljajih pri športnikih rizičnih športov. Definirali smo športe, ki jih lahko opredelimo kot rizične, predstavili izraze, s katerimi tovrstne športe opredeljujemo in nato predstavili izsledke študij s tega področja, najprej tujih in nato še dveh slovenskih. V nadaljevanju smo povzeli rezultate, ki so jih potrdile različne študije (številni raziskovalci ugotavljajo, da imajo športniki rizičnih športov visoko izraženo potrebo po dražljajih, večina študij tudi ugotavlja, da so ekstravertirani), nato pa smo predstavili še rezultate, ki so si v študijah nasprotujoči (tako obstajajo dvomi o tem, ali lahko športnike rizičnih športov raziskujemo kot homogeno skupino ali jih moramo ločevati glede na posamezne športe). Ogledali smo si tudi metodološke vidike študij (nizko število preizkušancev, v študijah običajno sodelujejo samo moški udeleženci) ter predlagali nekatere možne vidike za nadaljnje raziskovanje.

Ključne besede: rizični športi, ekstremni športi, športniki rizičnih športov, osebnost, potreba po dražljajih

PROBLEM DEFINITION

Athletes who engage in high risk sports (in the continuation high risk sports athletes) are often referred to as unreasonable, uncontrolled, suicidal maniacs with no respect for their lives (Žiberna, 2000). It is frequently assumed that they are pathological in some way or another, that they have a warped idea of themselves and of the world, yet numerous scientific studies show that they have healthy personalities, which closely resemble the personalities of top athletes, but they have higher sensation seeking needs, which could serve as the explanation as to why they engage in high risk sports in the first place. This article will present the studies about high risk sports athletes and point out some of their methodological aspects. The term »high risk sports« is often loosely applied to »extreme« and »adrenaline« sports (Žiberna, 2000) while Breivik (1995) defines it as »any sport where one has to accept a possibility of severe injury or death as an inherent part of the activity«. We use it for describing sports such as alpinism, white water kayaking, diving, Nordic jumping (Burnik & Tušak, 1999) as well as some other sports, which include: downhill skiing, parachute skydiving, parachute gliding, downhill bike riding, speleology, freestyle snowboarding, motocross, car racing, speed boat racing, slay racing, free style skiing, aerial skiing and some other modern sports. The psychological research mainly uses the term high risk sports (Breivik, 1995; Campbell, Tyrrell, & Zingaro, 1993; Chirivella & Martinez, 1994; Cogan & Brown, 1999; Cronin, 1991; Goma & Freixanet, 1991; Jack & Ronan, 1998; Kajtna, 2003; Kerr, 1991; Rossi & Cereatti, 1993; Wagner & Houlihan, 1994; Zarevski, Marušić, Zolotić, Bunjevac, & Vukosav, 1998), therefore we will use the same expression: high risk sports and high risk sports athletes.

SUMMARY OF PREVIOUS RESEARCH

High risk sports research

Several researchers have examined sensation seeking in high risk sports athletes. Some of them investigated which scales are appropriate for measuring sensation seeking. Zarevski, Marušić, Zolotić, Bunjevac and Vukosav (1998) tested 94 pairs of high risk sports athletes (parachute skydivers, divers, alpinists, speleologists and parachute gliders) and non-risk sports athletes (track and field athletes, rowers, bowlers and table tennis players), matched in age and education, in order to establish the adequacy of Zuckerman's Sensation Seeking Scale (SSS-V) (Zuckerman, 1994) and of Arnette's Inventory of Sensation Seeking (AISS). They found high risk sports athletes to have higher scores on all four factors of SSS-V and on both factors of AISS, which meant that they have higher sensation seeking needs than athletes who engage in non-risk sports. The adequacy of SSS-V for measuring sensation seeking in male athletes was established also by Straub (1982).

Breivik conducted numerous studies in high risk sports, mainly in the field of personality and sensation seeking in connection with certain physiological measures. Breivik (1999d) believes that each area is best represented by the people who achieve the most in that particular area and thus includes only top athletes as subjects in his research. He believes in the existence of the so-called filter system, which causes certain athletes to drop out of the activity due to being inadequate because of some psychological or physiological characteristics of that particular individual (Breivik, Johnsen, & Augestad, 1994). Another of Breivik's studies (1999c) also speaks about the filter system and compares top alpinists with other alpinists and finds less concern in top alpinists. They are less anxious and more stable, they also have higher risk and experience factors than the rest of the subjects. The author considers that the proof for the filter system lies in the fact that the same differences in the same direction are found also between other alpinists

and non-athletes. In the comparison of skydivers, alpinists and military recruits (Breivik, 1999a) he found that skydivers were the most extraverted, had highest scores on psychoticism as well as risk and experience factors, and their general risk factor was high. Alpinists achieved similar results but were the most introverted of the three groups. He also mentions the existence of two types of alpinists, the first type are more introverted and sensitive, with relatively high tension and anxiety – this type is found in British and Italian studies on alpinists (Breivik, 1999b), while the other type consists of more independent alpinists with fewer feelings of guilt and anxiety. The latter type is found in Czech, Slovakian and Norwegian studies (Breivik, 1999b). He also establishes that alpinists are not an extremely extraverted group, and that they score highly on boredom susceptibility. This study also showed that impulsivity is not the decisive factor in risk taking – alpinists consider risk taking to be calculated and planned (alpinists achieved low scores on the impulsivity scale).

Breivik, Joergensen, Morstad and Augestad (1999) found negative correlations between extraversion, risk and experience factors and heart rate increase in an unknown, risky situation (subjects were high risk sports athletes and students and were pushed off a diving board in a kayak). Authors concluded that extraverts and high sensation seekers get less aroused in physically threatening situations than more anxious persons and show less fear facing such situations, regardless of whether they are known or unknown.

Cronin (1991) is one of the authors who investigated mainly alpinists. He focused on connections between alpinism and sensation seeking and assumed that alpinists would score higher on the common sensation seeking factor and subscales of risk and experience. He also supposed that they would achieve lower scores on disinhibition and boredom susceptibility – disinhibition with its impulsivity and extraversion should be inconsistent with planning requirements of mountain climbing, whereas boredom susceptibility should be incompatible with a high number of repetitions, needed to succeed as an alpinist. A sample of 20 alpinists confirmed his assumptions and also showed that the results do not stem from a momentary tendency in the subjects or from the desire to be briefly involved in a great number of sports, since all his subjects have been alpinists for at least four years at the beginning of the study.

Campbell and colleagues (1993) investigated sensation seeking in white water kayakers and canoeists. They included both male and female athletes and found that both had higher scores than the normative values on the risk scale. The results should be particularly relevant, as the authors conclude that a higher score actually represents higher sensation seeking, since the risk scale does not include questions regarding those two sports, which could lure the subjects to answer in a predictive manner – this is otherwise a common objection with that scale. Chirivella and Martinez (1994) tested sensation seeking in high risk sports athletes (parachute gliders), medium risk sports athletes (karate) and non-risk sports athletes (tennis). They found that as the sport that they would also like to engage in the athletes chose the sports that were similar to their own in terms of riskiness. The risk factor differentiated between high risk sports athletes and the other two groups, who had the factor expressed equally. The differences between them were not significant. Parachute gliders are telically oriented, they take their activity seriously, even though they realise the risk, but do not seek out socially risky or socially unacceptable situations. They like experiencing strong and pleasant feelings, yet within social norms and regulations. They also found that the educational level positively correlates with the level of engagement in high risk sports, and attribute that to higher economical abilities of well educated individuals – high risk sports can be quite expensive.

Some authors approached sensation seeking through the scale of telic dominance. Kerr (1991; Kerr & Svebak, 1989) states that high risk sports athletes are paratelicly dominant. The most consistent (the research included three separate samples from Australia, Netherlands and Great Britain) were the results which showed low stimulus avoidance in high risk sports athletes. Therefore we can assume that they are sensation seekers, compared with non-risk sports athletes, who displayed high stimulus avoidance tendencies. Proactive negativism, however, was not found in high-risk sports athletes (Vlaswinkel & Kerr, 1990). Cogan and Brown (1999) used the same scale to compare freestyle snowboarders (high risk sport) and badminton players (non-risk sport) and came to similar findings. Non-risk sports athletes displayed more stimulus avoidance than the other group. They also concluded that high sensation seekers look for complex environments that provide more opportunities for much excitement. Wagner and Houlihan (1994) investigated high risk sports and athletes that engage in them and found that gliding pilots obtained significantly higher scores than golfers. Normative results on all factors of sensation seeking scale confirmed their hypothesis that high risk sports athletes are high sensation seekers.

Some authors adopted an extensive approach to studying the profiles of high risk sports athletes. Goma and Freixanet (1991) conducted a study, in which she compared the personality characteristics and sensation seeking in alpinists, mountaineers, free climbers and extreme skiers as well as other high risk sports athletes (divers, water skiers, boat racers, white water kayakers, pilots, skydivers, ballooners, motorcycle racers, adventurers) and people who did not engage in any type of risky activity. The authors established that alpinists achieved the same results as free climbers and extreme skiers, and all »high risk« groups scored significantly higher than the control group in risk and experience scale as well as on the common sensation seeking factor, and were significantly more extraverted. There were also no differences between those athletes and the other group of high risk sports athletes, which led the authors to conclude that different high risk sports athletes can be treated as a single group. The test of correlation between used measures showed a positive correlation between sensation seeking and extraversion and psychoticism on Eysenck's Personality Inventory. Extraversion correlates most with disinhibition, with the common factor of sensation seeking and with the score obtained by subtracting the risk factor from the common factor. The correlation between neuroticism and sensation seeking was not significant. High risk sports athletes in all groups achieved lowest results in neuroticism, however, the differences were not significant. Risk takers can be divided into three groups according to the type of risk they are taking with respect to social rules (Levenson, 1990), and as Zuckerman (1994) stated, the factor of risk expresses socially acceptable risk taking. It can be concluded that high risk sports athletes engage in socially acceptable risk taking, just as »firemen«, as this group was named by Goma and Freixanet (1991). The psychological profile of these people includes extraversion, emotional stability, taking into account the social rules of the environment in which they live and sensation seeking in a socially acceptable manner.

Another study in which researchers focused on more than one psychological aspect of high risk sports athletes was conducted by Robinson (1985). He found high risk sports athletes to be high in sensation seeking, low in trait anxiety and moderate in need for achievement.

Jack and Ronan (1998) tested Zuckerman's hypothesis that sensation seeking is a part of a broader personality dimension, called impulsive sensation seeking (Zuckerman, 1994), which would actually connect impulsivity as a personality trait and sensation seeking. Their results confirm Zuckerman's assumptions, since they obtained significant differences in impulsivity between low and high sensation seekers – the latter were more impulsive, and they also found positive correla-

tions between the common factor of sensation seeking and its subscales and impulsivity. Also in this case, high risk sports athletes were high sensation seekers and non-risk sports athletes were low sensation seekers. The same conclusion was made when the common score was corrected by subtracting the risk factor. Iso-Ahola and Graefe (1989) are among the few authors that focus also on other aspects of high risk sports athletes besides personality and sensation seeking. They investigated self-esteem in high risk sports athletes and found that perceived competence with a specific climbing occasion rather than the number of climbs per year or the number of years climbing increased self-esteem.

The majority of high risk sports studies in Slovenia were carried out on samples of alpinists. Thus Markič (1990) with the use of Cattell's 16 PF found alpinists in comparison to the general population to be more withdrawn, more independent, individualistic and used to having their own ways. He also discovered that they reject traditional standards and have moral standards of their own, they were introverted, socially shy, serious and calm. He established that they have a strong desire for exploring, gaining new experience and experiencing adventures. In comparison with sports climbers they were more introverted and had lower ego strength, however, this group displayed a unique set of moral standards as well. A study of Burnik and Tušak (1999) used the Freiburg personality inventory, which showed alpinists to be less neurotic, more extraverted, more open and sociable than the general population, although the sincerity was a bit lower as was the trait anxiety. The alpinists were emotionally more stable than the general population. Some authors were testing personality characteristics of Nordic jumpers and divers. Tušak and Bednarik (2001) found out that Slovenian top Nordic jumpers are more sociable, masculine and sincere than the general population, with tendencies toward higher extraversion, dominance and emotional stability in comparison to non-athletes. The study of personality characteristics of divers showed that they are more extraverted and calmer than recreational athletes (Tušak, Burnik, & Robič, 2001), which lead the authors to believe that they are capable of calmly responding to different types of stress and have a high ability of problem solving. The authors also tested their sensations seeking needs and found no significant differences between the groups although divers achieved higher scores on all factors except disinhibition. Kajtna (2003) performed a study on a group of mixed sports high risk sports athletes and compared them with non-risk sports athletes and non-athletes, establishing that they have mature personalities and do not attempt to seek stimulation in social environments, but in sport activities and lifestyle. High risk sports athletes had highest scores in emotional stability, conscientiousness and energy in the five-factor model of personality as well as the highest scores on common sensation seeking factor, and on risk and experience factors.

EXPLANATION OF SUBJECT MATTER INTER-RELATIONS

Breivik (1999c) attempted but failed to confirm the thesis of Eysenck and Eysenck (1985) who stated that extraverts' higher optimal level of stimulation influences higher abilities to successfully function under stress in extraverts and that they also endure pain more easily. He did, however, find a higher risk and experience factor in alpinists, white water kayakers and parachute skydivers. The differences in disinhibition and boredom susceptibility were not significant. That confirmed Levenson's hypothesis (1990) that high risk sports athletes are oriented basically towards physical types of risk taking. The same study confirmed also Zuckerman's finding (1979) that a connection exists between Cattell's secondary factor of independence and risk and experience factor, as well as that a correlation is present between disinhibition and boredom susceptibility and extraversion.

Breivik's (1999d) study showed differences in neuroticism and extraversion between skydivers and alpinists, which was ascribed to the characteristics of those particular sports – especially formation skydiving requires a lot of extraversion and cooperation. This finding also convinced him that different types of high risk sports should be investigated separately (Breivik, 1999a). Wagner and Houlihan (1994) confirmed the same hypothesis as Rossi and Cereatti (1993), who researched free climbers, alpinists, speleologists and Nordic ski jumpers, who reached higher scores on all Zuckerman's subscales than did the two used control groups – the only factor where differences were not significant was boredom susceptibility. They, too, believe that the reward for engaging in risky sports activities (all four groups could evaluate their activity as risky) is a feeling they get from it, and emphasise that sensation seeking is an active process, since it also requires a great deal of resisting the boredom. That can be achieved through strong motivation for engaging in sports (Rossi & Cereatti, 1993).

Goma and Freixanet's (1991) results correspond to study reports of the personality of athletes by Eysenck, Nias and Cox (1982), where athletes turned out to be more extraverted and in which higher levels of psychoticism were recorded, yet with less neuroticism than in non-athletes.

CONTRADICTIONS

The results of Burnik and Tušak (1999) and the results of Markič (1990) were somewhat different. The contradiction between the results of both studies is explained by the authors of the latter research by a certain characteristic of mountain climbing: it is becoming more and more similar to other top sports, taking into account the recently more marked competitive aspect of that sport.

An interesting result of Breivik's study (1999d) was that he found high risk sports athletes to be the most willing to take social types of risk, which contradicts some of his previous findings (1999a). The same finding is also contrary to Levenson's findings (1990) that high risk sports athletes usually take risks which are not socially risky or socially unacceptable. Chirivella and Martinez (1994) concluded that the distinction between high, medium and non-risk sports is not necessary, since the mere division between high risk sports and the rest of sports is sufficient, which is exactly the opposite to previously described Breivik's results (1999a).

High risk sports researches are interesting as well as problematic also because of the number of subjects and their gender as most of the studies were carried out on the male samples. Table 1 shows the overview of mentioned studies.

The table 1 shows that the majority of the studies were carried out with male participants, several studies did not include non-risk sports participants, and some of the studies were performed on rather small samples, which can present a methodological problem. Another serious problem is the level of high risk sports athletes – not all athletes that participated in the above-mentioned studies were of the top level, which according to Breivik (1999a) can be the cause for questioning the representativeness of the sample.

SUGGESTIONS FOR FURTHER RESEARCH

This conclusion contains some views on how this field could be further investigated and how the existing knowledge could be expanded. The main suggestion is to conduct more research that would investigate female high risk sports athletes, since several interesting sports studies show that the differences between male and female athletes are disappearing (Erjavec, 2002; Kajtna, Tušak, & Kugovnik, 2003). It would be interesting to find if the same trend is evident also in

Table 1: Structure of participants in some high risk sports studies

<i>Author</i>	<i>High risk sports athletes (N)</i>	<i>Non-risk sports athletes (N)</i>	<i>Non-athletes (N)</i>	<i>Instruments</i>
Burnik & Tušak (1999)	M = 24	/	M = 26	FPI, STAI – X1, STAI – X2, Buss - Durkee
Tušak, Burnik, & Robič (2001)	M = 20	/	M = 20	FPI, PMQ, SSS IV
Tušak & Bednarik (2001)	M = 23	/	M = 26	FPI, STAI – X1, STAI – X2, Buss – Durkee, Costello, SAI, SMI, TEOSQ
Kajtna (2003)	M = 36	M = 36	M = 72	BFO, MLV, SSS IV
Zarevski, Marušič, Zolotić, Bunjeva, & Vukosav (1998)	M = 94	M = 94	/	SSS V, AISS
Breivik (1999a)	M = 39	/	M = 69	SSS V in VI, 16 PF, EPQ, Risk test 2, Opinion Questionnaire II, Achievement motivation scale, Situation inventory
Breivik (1999b)	M = 7 + 38	/	M = 69	SSS V, 16 PF, Risk test 2, Opinion Questionnaire
Breivik (1999c)	M = 89	/	M = 69	SSS V, 16 PF
Breivik, Joergensen, Morstad, & Augestad (1999)	M = 8	/	/	EPQ, 16 PF, SSS V in VI, IVE, STAI, Opinion questionnaire II, Achievement motivation scale, SSAST
Cronin (1991)	M = 9, F = 11	/	M = 8, F = 13	SSS V, demographical questionnaire
Iso-Ahola & Graefe (1989)	M = 95	/	/	Rosenberg Self-esteem scale
Campbell, Tyrell, & Zingaro (1993)	M = 43, F = 20	/	/	SSS V, demographical questionnaire
Chirivella & Martinez (1994)	M + F = 21	M + F = 83	/	SSS V, TDS, NDS0
Kerr (1991)	M = 63	M = 39	/	TDS
Cogan & Brown (1999)	M = 36	M = 26	/	TDS, NDS, T / PSI
Wagner & Houlihan (1994)	M + F = 170	M + F = 90	/	SSS V, STAI - Y
Rossi & Cereatti (1993)	M = 67	M = 20	M = 20	SSS V, Inventory on sport riskiness assessment
Goma & Freixanet (1991)	M = 320	/	M = 54	SSS V, EPQ, IVE, CPI, SP, SR
Jack & Ronan (1998)	M = 83, F = 10	M = 36, F = 37	/	SSS V, IVE, demographical questionnaire

Legend:

M – numerus of male participants

F – numerus of female participants

high risk sports. Also, deeper and more thorough research should be done on the creation of profiles of high risk sports athletes – the current literature contains only the studies by Goma and Freixanet (1991) and Kajtna (2003), involving the profiles of top high risk sports athletes. The Slovene researchers should consider an attempt to translate a more recent version of the Zuckerman's SSS, since most of the authors abroad are using versions V and VI (e.g., Breivik et al., 1999; Goma & Freixanet, 1991; Jack & Ronan, 1998; Rossi & Cereatti, 1993; Wagner & Houlihan, 1994), whereas Slovene researchers are still using the older version (e.g., Kajtna, 2003). Another suggestion in high risk sports research in the field of psychology would be also to include some other fields of psychological research, such as motivation instead of mainly personality and sensation seeking behaviour.

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