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# LIVE OR DIE:
# EXTREME-ATHLETES' PERSONALITY STRUCTURE AND FUNCTIONING, MOTIVES, AND FLOW-EXPERIENCE

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**Dedicated to all of those who have perished due to their sport, and to their loved ones.**

**" It is not death that a man should fear, but he should fear never beginning to live."**

**- Marcus Aurelius**

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## ABSTRACT

**The main purpose of the present study was to investigate high-risk extreme-athletes' personality structure and function, motives and flow-experience. Primary method was Exner's Rorschach Comprehensive System personality assessment method. Secondary methods were CMPS-personality-inquiry, motives of action and flow-experience questionaries. Three Finnish groups were compared, alpinists (n = 10), skydivers (n = 10) and soccer-players as a control-group (n = 9). Most important criterion in group forming was high experience. Only men were selected. Data was analyzed statistically with SPSS-program. Results indicate that alpinists' perception style and information processing is precise and detailed and they put lot of effort in it. They reflect themselves more than the other groups, and this self-reflection is often critical even negativistic. In social relations alpinists seem to be outgoing and socially active, even though some discrepancy between sociability and oppositional tendencies toward the environment seems to occur. Our results do not support previous studies that have postulated that skill development would not be an important motive among experienced alpinists. Skydivers are more distant in their social relations, and they seem to seek personal enjoyment and sensations even at the expense of their social relations. Results indicate that skydivers are not such 'freaks' that seems to be the case according to populistic opinions. They often make usual and common decisions and choices in their everyday lives. Intrinsically rewarding motives such as hedonism and sensational nature of action were emphasized.**

**KEYWORDS: extreme-sports, dangerous sports, risk sports, Rorschach Comprehensive System, personality, motives**

# INTRODUCTION

Dangerous and high-risk extreme-sports have been coming up in a cumulative manner in different media in the recent half-decade. Simultaneously the number of athletes in these sports has increased.

Risk of serious injury or death is in essential role in extreme-sports. Ewert (1989) has described risk recreation as a recreational activity, which contains risks and danger experienced in natural environment and where individual's actions and abilities play a very important role considering the outcomes of the action. Ewert (1994) also postulates that risk taking in itself is not an important motive in extreme-sports. According to Apter (1992) extreme-sports are not game like situations or a question of a coincidence. It is more a question of taking "a calculated risk". For example considering the excitement of mountain climbing the question is about going in a dangerous situation and beating the dangers by using one's own skills and abilities. Another typical example of extreme-sports is extreme-skiing. Slanger and Rudestam (1997) describe this sport as skiing or snowboarding in dangerous and very demanding environments. The action takes place in very steep ravines, on rocky and icy walls, where the differences of heights are very big, often thousands of meters. Falling down causes every time a serious injury or death.

During the first half of the century physical risk taking was considered as a sign of pathology (Adler, 1930; Deutsch, 1926; Fenickhel, 1939, 1945 and Huberman, 1968). According to Groves (1987) Freudian death wish, castration anxiety, fear displacement, acting out of psychopathic fantasies, compensation of feeling not good enough and fantasies of omnipotence have earlier been the explanations for taking part in extreme-sports. During the recent three decades researchers have commonly agreed that theories, which explain extreme-sports through pathological personality characters and motives are wrong. Idea of extreme-athletes being disturbed is just a myth (Groves, 1987).

The main interests of psychological and sport psychological research on extreme-sports have been extreme-athletes' personality and motives; What kind of people voluntarily seek dangerous situations and environments, and why?

According to Lyng (1990) there is two opposite types of personalities: Those

who seek and appreciate risky and dangerous situations and those who dislike and avoid them. Klausner (1968) has called the formers as stress-seekers.

Zuckerman (1979) talks about sensation-seeking. This is a type of personality, of which main character is "the need for varied, novel, and complex sensations, and the willingness to take physical and social risks for the sake of such experiences" (Zuckerman, 1979). A sensation seeker usually feels strong positive sensations and affects in new, unexpected, and exciting situations. Zuckerman (1979b) found positive correlation between sensation-seeking and extroversion, impulsiveness, individualism, and weak self control. On the other hand, sociability had negative correlation with sensation-seeking. According to Hymbaugh and Garret (1974) skydivers got significantly higher values on Sensation Seeking Scale than control group.

Farley (1986) introduced the Big-T personality (thrill seeking personality). He describes this personality type as a continuum: the other end represents the Big-T personality the other one representing the Little-t personality. Most of the people are situated somewhere in the middle of this continuum. Big-T:s seek new sensations and excitement and the Little-t:s want to avoid exciting, new, and risky situations. Farley describes an extreme-athlete as a Big-T, who directs his/her actions and thinking constructively and physically.

Apter (1982) has examined risk takers and their way to perceive, to structure, and to interpret environment's information and stimuli in his Reversal Theory. According to this theory an individual with dominantly paratelic personality usually feels high arousal level exciting and pleasant and he/she appreciates and seeks excitement and risks in order to raise the arousal level. Dominantly telic individual usually feels high arousal level unpleasant and distressing

Cloninger (1987) introduced the concept of novelty-seeking. This concept describes a personality type which is characterized as being a type of an individual who is fascinated by novelty and new experiences. This type of personality is closely related to sensation seeking, impulsiveness, and avoidance of dullness and apathy.

Eysenck & Eysenck (1978) and Kerr & Svebak (1989) postulated that extreme-athletes participate in risky activities in a rational manner and after planning ahead and not without thinking or impulsively. Also Slanger and Rudestam (1997) emphasized

the concept of "calculated risk" often used among extreme-athletes. Knopf (1983) stated that participants of risky activities also have a strong need for control and mastery. According to Slanger and Rudestam (1997) the risk sports participants did get higher values on self-efficacy scale than the participants of less risky activities.

The basic idea behind the research approach based on individual's motives is that participating in risky activities, like extreme-sports, serves the achievement of certain goals or desired outcomes. In recreational context this includes for example goals of rising the arousal level and getting excited (Ellis, 1974; Klausner, 1968; Loy & Donnelly, 1976). Lazarus & Averil (1972) and Sarason (1975) stated that activity experienced as dangerous and/or threatening do rise the arousal level. Again according to Slanger and Rudestam (1997) the motives behind many risky sports, like skydiving, are to raise the level of arousal or excitement.

The approach based on motives also contains some questions about life values, individuality, and independence (Deci and Ryan, 1985; Howard, 1976; Klein, 1978). Macbeth (1988) has stated that solo ocean cruising offers to the participant that kind of feelings of competence, independence, individuality, and joy which are not often available in a modern everyday society.

According to Driver and Brown (1975), Schreyer and Beaulieu (1986) and Watson et al. (1991) extreme athlete's experience level may have remarkable influence on his/her motives for participation. When the experience level and knowledge gets higher, the participant has a larger scale of concepts, preconceptions, and motivational factors in use (Carrol and Johnson, 1990; Hogart, 1980).

One can say that a high experience level has an influence to motivational factors for different reasons; according to Williams et al. (1990) through cognitive restructuring, according to Spinelli (1989) through reinterpretation of the observation of the environment's information, and on the other hand, according to Little (1987), through participant's more exact specialization. Cognitive developmental theory postulates that while the knowledge base grows along with the experience level, participant's understanding of the activity diversifies and develops more complicated. An experienced extreme-athlete is able to evaluate the risks of the activity and to compare them to his/her planned actions (Moore, 1976; O'Keefe , 1990; Williams et al.,1990).

According to Horwath and Zuckerman (1993) it can be possible that in a process of learning through perceiving non-sensation-seekers focus more on the negative outcomes of the action, while the sensation-seekers focus more on the enjoyment, positive affective outcomes, and external rewards of the action. Csikszentmihalyi (1975b) compared motives of different sports and found out that rock climbers' main motives were enjoyment and pleasure, and using own skills, on the other hand basketball players' most important motives were competition and comparing self to others.

The Flow-Theory was introduced by Mihaly Csikszentmihalyi (1974). It is a theory of internal motivation, by which one can explain motivational rises and falls in everyday life, in job or in recreational context. Flow is a sum of momentary motivational states, which constitute the whole human life. The Flow-Theory explains these motivational states, and by that the whole human life, through the challenges of activities, and on the other hand through the skills of the participator. Massimini and Carli (1986) stated that a flow-experience starts when both, the challenges and the skills, go beyond a certain point and are in balance with each other.
According to Csikszentmihalyi (1974) the criteria for the flow-experience on the individual's point of view are action and awareness merging, narrowing of awareness, blurring of the sense of time, concentration on task at hand, and sense of competence and control. On the activity's point of view the criteria are feeling of satisfaction, clear goals, and unambiguous feedback for one's actions. According to Mitchell (1988) the optimal state of arousal, like the flow-experience, can be achievable only when meaningful and sometimes fateful outcomes of the actions depend strongly on the skills and actions of the participant.

There have also been biological approaches on the field of sensation-seeking research. According to several studies high values on Sensation Seeking Scale have a positive correlation with a low MAO-level. MAO (Monoamine Oxidase) is an enzyme, which has a function for example in mitochondria of neurons. One of MAO's functions is to regulate transmitters (Zuckerman, 1983). Genetic studies about biological backgrounds of sensation-seeking have been done with twins. Zuckerman (1983) stated

that with identical twins 58 % of sensation-seeking could be explained by genetic factors.

According to Garpenstrand et al. (1997) D4-Dopamine-Receptor gene (D4DR) is connected to sensation-seeking and novelty-seeking. On the other hand Sullivan et al. (1998) postulated that there is no evidence for statistical correlation between D4DR-gene and sensation-seeking. Genetic background for sensation-seeking remains unclear.

Former studies have explained participation in risk-sports through personality, motivational, and biological factors. Personality studies have based mainly on different kinds of trait theories. Methods, which extensively describe personality structures and functions, like the Rorschach Comprehensive System, have not been used on the field of extreme-athletes research. Extreme and risky-sports research has also had its focus either on personality or motivation. Combination of these points of views has been quite low.

The main purpose of this study is to research the structures and functions of extreme-athletes' personality – which kind of people participate in risky activities braving death? The other interest is to look for answers to the question: "Why ?". The latter question is examined by comparing the possible differences between the groups in motives and flow-experiences. We compare three groups; alpinists, skydivers, and soccer players. The last group is a low risk group and it serves as a control group in this study.

# METHODS

## Subjects

The present study included 29 Finnish male subjects. Three groups were formed and compared; alpinists (n = 10, 34%), skydivers (n = 10, 34%), and soccer players (n = 9, 33%). Alpinists' average age was 28 years, skydivers' 32 years, and soccer players' 20 years. The subjects were acquired mainly through personal contacts of the

authors. Most important criteria in group forming were intensive participation in particular sport for several years and high experience, which enhanced the similarity of the groups. The alpinists were presumed to have several experiences from the most important international climbing and extreme-skiing resorts (for example Himalayas, Pamir, Alps). Some of the alpinists reported their main sport as extreme-skiing, others reported their main sport as different varieties of climbing (ice, mountain, or rock climbing). The skydivers were required to have a C-certificate (certificate of competence parachuting) and at least one hundred jumps experience. The soccer players were required to train at least as half professional basis and to have experience and success at least in national first division level. 80 % of the alpinists were from the capital city area, 20 % from the area of Lahti in South-Western Finland. The skydivers were members of a skydiving club in Middle-Finland, and the soccer players were members of a team in Middle Finland playing in the national first division league. The first contacts with the subjects were made by phone or orally. Every volunteer subject received an information letter, which contained information about the purpose of the research and also of the confidential nature of the study, and of the possibility to get personal feedback about personality structure and function. Participation was voluntary and there was no reward paid.

In the sports the subjects represent, males are the majority, so only men were selected in the study. This enhanced the representativeness of the samples and eliminated the differences emerging between genders in the CMPS personality-inquiry. In the Rorschach Comprehensive System personality assessment method there is also some gender differences in the a/p and AG variables (Exner 1993a). Age was taken into account by choosing the three groups so the average age was as similar as possible. The similarity of the groups was also enhanced by choosing subjects with a sporty life style, so the possible differences in the results would not depend on this matter.

# Research methods

## The Rorschach Comprehensive System

The primary research method was The Exner's Rorschach Comprehensive System personality assessment method. Hermann Rorschach developed 75 years ago a method, which was named after him. Later this method became one of the most used psychodiagnostic tools. During the years the Rorschach method was criticized for lacking systematic structures and for low reliability and validity. 1968 American John E. Exner Jr. started an empirical research which included all the former coding and interpretation hypothesis of the Rorschach. Based on the data of thousands of subjects and following the Rorschach's original perceptional cognitive nature Exner developed the method which is reliable and valid, both in clinical work, and in scientific research (Ilonen, Tuimala & Uhinki, 1997). According to the research, which examined Rorschach CS's validity by Parker et al. (1988), Rorschach CS and MMPI methods have comparable, reliable, and valid psychometric qualities. Rossi (1990) studied all the researches published in *the Journal of Personality Assessment* between 1975 – 1990 and stated that Rorschach CS research is statistically measured as effective as any other research on the field of behavioral sciences. Exner and Weiner (1995) found in their follow-up study that Rorschach CS variables which describe state-like characters of personality ( for example Afr, M, T ) remain unchanging at the level of .80 as far as next three years. Again for example Parker (1988), Rossi (1990), and Exner and Weiner (1995) have postulated that The Rorscach CS is a valid method for assessing personality structures and functions. Weiner (1998) concludes that The Rorschach Inkblot Method is a psychometrically sound measuring instrument.

Considering the reliability of the Rorschach CS method, there are three important points to pay attention to; first, the users of the method should have similar, empirically and officially verified education in the Rorschach Comprehensive System method. Second, the method should always be done following the principles, structures, and rules of the Rorschach CS method. Third, a sufficient estimator reliability (80%) for the

codes (scorings) of the records should be verified by cross-scoring the records with a researcher with a similar Rorschach CS education (Exner, 1991).

Within the present study the Rorschach CS records were typed into transcriptions and scored. Two of the records were rejected for poor validity. In the first one the total amount of responses (R) was too low (12) and in the other one the inquiry phase was insufficient. The estimator reliability testing was made by cross-scoring records (Exner, 1986). Because only the other one of the authors had the two years education of *The Finnish Rorschach Association for the Comprehensive System*, the cross-scoring was made with two outsider researchers with similar official Rorschach CS education. 36 % (10) of the records were selected randomly for the cross-scoring. These records contained total 320 responses. The similarity percents (estimator reliability) for the cross-scored Rorschach CS variables were: Location 86 %, Developmental Quality (DQ) 87 %, Location number 87 %, Determinants 75 %, Form Quality (FQ) 76 %, Pair Responses 87 %, Primary Contents 82 %, Secondary Contents 81 %, Popular Responses 98 %, Organizational Activity (Z-value) 80 %, and Special Scores 80 %. Most of the differences between the codes can be explained by the researcher's better understanding of the subject's verbal and nonverbal communication in a face-next-to-face research situation. The outsider cross-scorer makes his/her scorings just from the record and the location sheet (Schemablock). All the other statistical criteria and structures for Rorschach research (Exner, 1992; Kinder, 1992) were also followed.

The records' codes were calculated into structure variables using the RIAP (Rorschach Interpretation Assistance Program) Version-2 computer program. These structure variables are composed of the sum variables and quotient variables calculated from the codes of the records. Six indices and seven clusters are formed from the structure variables. Due to the explorative approach of the study all the Rorschach CS indices (6) and all the RCS clusters (7) were examined. Interpretationally meaningful amount of sum variables and quotient variables were also chosen into examination. From these variables 45 were continuous and the rest 121 were dichotomic.

## CMPS

The other method for getting information about personality was the CMPS personality-inquiry (Cesarec-Marke Personality Schema), which is based on the H. A. Murray's (1938) theory of needs. The inquiry contains 165 questions, which form 11 needvariables and a scale of acquiescence, which measures the tendency to give socially acceptable answers regardless of the content of the questions. The needvariables are: Need of achievement, Affiliation (need for company and friendship), Aggression, Defense of status (need for protecting self-esteem), Guilt feelings, Dominance (need for leadership), Need for exhibitionism, Autonomy and independence, Nurturance (need for taking care for others), Need for order, and Need for succorance (to be taken care for by others). Five indices are formed from these needvariables: Neurotic self-assertation, Dominance, Aggressive non-conformism, Passive dependence, and Sociability. All these variables and indices are finally scaled from 1 to 9.

## Other research methods

Motives were examined with the "motives of actions" -questionnaire (appendix 3) which is based on Csikszentmihalyi's (1975b) "Eight Reasons for Enjoying an Activity" -questionnaire. In the questionnaire the subject was supposed to put eight reasons, or motives, for participating in the sport into order of importance. These eight reasons were: The activity in itself, Pleasure and using own skills, Development of personal skills, Friends and companionship, Comparing self and own ideals, Competition and comparing self to others, Reputation; rewards; honor, and Emotional discharge.

Flow-experiences were examined by "evaluation of own sport activity" – questionnaire (appendix 4). Theoretically this questionnaire is based on Csikszentmihalyi's (1990) flow-experience characteristics and criteria mentioned earlier in the introduction. The questionnaire gathered information about feelings during the particular sport. These feelings were Action-awareness merging, Concentration on task at hand, Blurring of the sense of time, Feeling of effortlessness during the activity in

connection with loss of self-consciousness, Sense of control, Feeling of goals being clear and logical, Feeling of getting clear feedback for own actions, and The autotelic nature of the activity. The structure of the questionnaire is based on Kirjonen and Kitvel's (1994) Evaluation of own activity -questionary.

Also information about experience, intensity, goals, and achievements in particular sport(s) were gathered by the "basic information sheet" (appendix 5). "Motives of actions" and "evaluation of own sport activity" -questionnaires were pilot-tested before the actual research. Rorschach CS variables, CMPS variables and the responses of the motives and flow-experience questionaries were analyzed statistically with the SPSS for Windows program.

## Data collection

Collection of the data took place between September 1997 and August 1998. Each subject were met personally once. During the meeting the Rorschach CS was presented to the subject following the Rorschach CS principles and structures. The subjects were examined so, that the examiner was not familiar with the examinee. Confidentiality was secured by using code numbers instead of names or any personal data. After presenting the Rorschach CS CMPS personality-questionary, motives of actions and flow-experience questionnaries, and the basic information sheet were given to the subjects for independent fulfilling. The researcher introduced the questionaries and sheets in detail to the subject. Returning of the inquiries happened by mail.

## Statistical analysis

The SPSS for Windows program was used for statistical analysis of the data. Possible differences emerging between the three qroups were examined. There were 121 dichotomic Rorschach Comprehensive System variables and the homogenity of the profiles between the groups was analyzed using the Chi-Square test. Due to the small sample sizes the pair comparisons between the groups were made by using the $G^2$ -test quantity. The test for homogenity indicates the brobability for average deviation between the groups. The final statistical significances were determined by the residual examination. The amount of continuous Rorschach CS variables was 45. These and the CMPS, and the flow-inquiry variables were examined by analyzing the similarity of averages between the groups using the one-way ANOVA. The pair comparisons between the groups were made with the LSD-test. The Kruskal-Wallis nonparametric test was used and the pair comparisons were made by using the Tukey-HSD -test quantity if the variables did not fulfil the hyphothesis of ANOVA. The results of the "motives of actions" questionaries were compared between the groups by calculating the average and the mode of the ordinal number given to each motive within the groups.

# RESULTS

## Rorschach Comprehensive System

The amount of the valid Rorschach CS records within the three groups was; alpinists 10, skydivers 8, and soccer players 9. Skydivers' average amount of given responses (R) varied statistically significantly, p = 0,021. Skydivers' average for R was 22,4 (SD 6,6), Alpinists' 36,3 (SD 14,2), and soccer players' 37,1 (SD 10,7).

Statistical analysis was made for 45 continuous and for 121 dichotomic Rorschach CS variables. Only those variables which had at least 0,05 level of significance variation between the groups were chosen into the final examination and interpretational analysis.

Also two interpretationally important variables (2AB+Art+Ay and 3r+(2)/R >.45) which had a p-value bigger than 0.05 were chosen into the final analysis. In the final analysis there were 15 continuous and 24 dichotomic variables. The variable differences between the groups and the average and percentage distributions are presented in tables 1 and 2. The variables are divided into Rorschach CS clusters which represent different psychological functions and structures.

**Table 1.**
**The group variations of the continuous Rorschach CS variables divided into RCS clusters .**

| Cluster and Variable | Group average[a] 1 | 2 | 3 | p-value[b] LSD/Tukey | Group differences[c] |
|---|---|---|---|---|---|
| Response Amount | | | | | |
| R | 36,30 | 22,38 | 37,11 | 0,021* | 2-1+3 |
| Capasity for Control and Stress Tolerance | | | | | |
| es | 18,10 | 9,00 | 13,67 | 0,030* | 1-2 |
| Adj es | 12,20 | 6,63 | 8,78 | 0,043* | 1-2 |
| EA | 14,30 | 8,00 | 13,94 | 0,050* | 2-1+3 |
| Y | 0,40 | 1,13 | 2,11 | 0,048* | 1-3 |
| Affective Features | | | | | |
| Blends/R | 0,33 | 0,16 | 0,18 | 0,016* | 1-2+3 |
| S | 6,60 | 3,38 | 3,89 | 0,012* | 1-2+3 |
| Interpersonal Perception and Relations | | | | | |
| COP | 2,20 | 0,50 | 1,30 | 0,022* | 1-2 |
| Self-Perception | | | | | |
| FD | 3,80 | 0,38 | 1,78 | 0,007** | 1-2+3 |
| Information Processing | | | | | |
| Zd | 4,75 | -0,50 | -4,28 | 0,003** | 1-2+3 |
| Zf | 19,30 | 10,88 | 19,44 | 0,019* | 2-1+3 |
| DQ+ | 10,80 | 4,13 | 9,22 | 0,040* | 1-2 |
| Cognitive Mediation | | | | | |
| Xu% | 0,36 | 0,25 | 0,43 | 0,008** | 2-3+1 |
| X+% | 0,48 | 0,57 | 0,33 | 0,009** | 3-2+1 |
| Ideation | | | | | |
| 2AB+Art+Ay | 6,30 | 3,00 | 5,89 | 0,086 | 1-2 |

a) 1 = alpinists, 2 = skydivers, 3 = soccer players.
b) * p<.05 **p<.01
c) For example: 1-2+3 = alpinists differ from skydivers and soccer players.

**Table 2.**
**The group variations of the dichotomic Rorschach CS variables divided into RCS clusters .**

| Cluster and Variable | %-frequences in groups[a] | | | | | | p-value[b] G-square | group differences[c] |
|---|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3 | | | |
| | yes | no | yes | no | yes | no | | |
| Capasity for Control and Stress Tolerance | | | | | | | | |
| D-score < -1 | 50 | 50 | 25 | 75 | 0 | 100 | 0,018 | 1-3 |
| Affective Features | | | | | | | | |
| S > 6 | 50 | 50 | 0 | 100 | 0 | 100 | 0,002** | 1-2+3 |
| Shd-Blends > 0 | 50 | 50 | 0 | 100 | 11 | 89 | 0,015 | 1-2+3 |
| Col-Shd-Blends with no Y > 0 | 50 | 50 | 0 | 100 | 22 | 78 | 0,024 | 1-2+3 |
| Interpersonal Perception and Relations | | | | | | | | |
| COP > 2 | 40 | 60 | 0 | 100 | 11 | 89 | 0,047 | 1-2+3 |
| COP ≥ 3 & AG < 2 or | | | | | | | | |
| COP > 3 & AG≤2 | 30 | 70 | 0 | 100 | 0 | 100 | 0,037 | 1-2+3 |
| COP = 0 | 0 | 100 | 63 | 37 | 33 | 67 | 0,005 | 2-1+3 |
| COP = 0 & AG = 0/1 | 0 | 100 | 63 | 37 | 22 | 78 | 0,005** | 2-1+3 |
| H + (H) + Hd + (Hd) > 7 | 60 | 40 | 0 | 100 | 56 | 44 | 0,005 | 2-1+3 |
| Self-Perception | | | | | | | | |
| 3r+(2)/R > .45 | 70 | 30 | 25 | 75 | 22 | 78 | 0,057 | 1-2+3 |
| FD > 2 | 70 | 30 | 0 | 100 | 11 | 89 | 0,000*** | 1-2+3 |
| V > 0 | 80 | 20 | 25 | 75 | 33 | 67 | 0,031 | 1-2+3 |
| FD > 2 & V > 0 | 70 | 30 | 0 | 100 | 0 | 100 | 0,000*** | 1-2+3 |
| FV+VF+V+FD >2 | 80 | 20 | 13 | 87 | 22 | 78 | 0,004 | 1-2+3 |
| Information Processing | | | | | | | | |
| W > 12 | 40 | 60 | 13 | 87 | 78 | 22 | 0,018 | 3-2 |
| Lambda > .99 | 0 | 100 | 37 | 63 | 33 | 67 | 0,038 | 1-2+3 |
| Zf < 9 | 0 | 100 | 50 | 50 | 11 | 89 | 0,014* | 2-1+3 |
| Zf > 20 | 40 | 60 | 0 | 100 | 44 | 56 | 0,030 | 2-1+3 |
| Zf > 13 | 90 | 10 | 25 | 75 | 67 | 33 | 0,013 | 2-1+3 |
| Zd > 3 | 60 | 40 | 0 | 100 | 0 | 100 | 0,000*** | 1-2+3 |
| Zd > 5 | 60 | 40 | 0 | 100 | 0 | 100 | 0,000*** | 1-2+3 |
| DQ+ > 9 | 70 | 30 | 0 | 100 | 33 | 67 | 0,003 | 1-2 |
| Cognitive Mediation | | | | | | | | |
| X+% < .50 | 70 | 30 | 25 | 75 | 100 | 0 | 0,001** | 3-2 |
| Xu% > .30 | 80 | 20 | 13 | 87 | 100 | 0 | 0,000*** | 2-1+3 |

a) 1 = alpinists, 2 = skydivers, 3 = soccer players
b) p-value: Probability for group averages to differ, * : Statistical significance for differences between the groups based on the residual examination.
c) Groups which differ from each other statistiacally significantly. For example 1-2+3 = alpinistis differ from skydivers and soccer players.

Capasity for control and stress tolerance. Alpinists got higher values than skydivers in the variables, which indicate experienced pressures of the environment's demands (es, experienced stimulation and Adj es, adjusted experienced stimulation). Skydivers got lower values than the other groups in the variable, which indicates accessable resources for controlling and coping life events and stress (EA, experienced actual). Alpinists got lower values than soccer players in the variable, which indicate experienced situationally-related stress and feelings of hopelessness in coping with it (Y). In D-score <-1 , the variable indicating weakened situationally-related capasity for control and stress tolerance, alpinists got more positive values than soccer players.

Affective features. In the variable, which estimates subject's psychological comlexity (Blends/R) and in the variable, which measures negativistic, oppositional or angry tendencies towards the environment (S, space) alpinists got higher values than the other groups. In the S > 6 -variable alpinists also got more positive values than the other groups. In the Shading-Blends > 0, the variable indicating the presence of intensely negative, probably painful emotion(s), and in the Color-Shading-Blends with no Y > 0, which hypothesizes that the subject often - not situationally related - is confused by emotions, alpinists got more positive values than the other groups.

Interpersonal perseption and relations. The COP - variable provides information about abilities to positive interactions among people and the AG - variable about aggressive or assertive forms of interactions. The interpretation of either of these variables is allways formulated with regard for the data of the other. In the COP - variable alpinists got higher values than skydivers. In the COP > 2 - variable, and the COP ≥ 3 & AG < 2 or COP > 3 & AG ≤ 2 - variable alpinists got more positive values than the other groups. In the COP = 0 and the COP = 0 & AG = 0/1 - variables skydivers got more positive values than the other groups. In the H + (H) + Hd + (Hd) >7 - variable, wich signifies a strong interest in other people, skydivers got less positive values than the other groups.

Self perception. This cluster develops a picture of subject's self-image and self-esteem. Alpinists got higher values than the other groups in the variable which indicates the occurrence of self-inspecting and self-reflecting behaviors (FD). In the FD > 2 - variable, which signifies considerable self-focusing behaviors, alpinists got more positive values than the other groups. In the V > 0 - variable, which signals the presence of discomfort, or even pain, that is being produced by focusing on perceived negative features of the self, alpinists got more positive values than the other groups. Alpinists got also more positive values in the FV+VF+V+FD>2, and FD>2 & V>0 - variables, which indicate ruminative and negativistic features in self-inspection. In the 3r+(2)/R > .45 (the Egocentricity Index) - variable, wich signifies that the subject tends to be highly involved with him/herself and possible narcissistic-like features in personality, alpinists got more positive values than the other groups.

Information processing. This cluster produces a picture of the procedures involving the input of the information, processing effort or motivation and quality and efficiency of the processing. In the W > 12 - variable, which is suggesting that the subject is motivated and makes reasonable effort in processing, soccer players got more positive values than skydivers. In the Lambda > .99 - variable indicating a stylistic tendency to oversimplify or narrow stimulus fields perceived as complex or ambiguous, Alpinists got less positive values than the other groups. In the DQ+ - variable, which indicates some estimation of the willingness and/or capasity to analyze and synthesize the stimulus field in a meaningful way, alpinists got higher values than skydivers. Also in the DQ+ > 9 - variable alpinists got more positive values than skydivers. In the variable which clearly relates to processing efficiency, effort, and accuracy (Zd), alpinists got higher values than the other groups. In the Zd > +3 and Zd > +5 - variables, which indicate trait-like characteristics that prompts the subject to invest more effort and energy into scanning activities, alpinists got more positive values than the other groups. In the variable that afford information about effort and organizing activity, the extent to which the subject has approached the task using more demanding cognitive tactics (Zf), skydivers got lower values than the other groups. In the Zf > 13 and Zf > 20 - variables, which indicate processing effort more extensive than expected, skydivers got less positive values than the other groups, and on the other hand in the Zf < 9 - variable (less effort) skydivers got more positive values than the other groups.

Cognitive mediation. This cluster describes the procedures of translating or identifying information that has been input. High values in the Xu % - variable and low values in the X+ % - variable afford information of higher frequency of behaviors that disregard social demands or expectations, overcommitment to individuality and less commitment to conventionality. In the Xu % - variable skydivers got lower values than the other groups. In the Xu % > .30 - variable skydivers got less positive values than the other groups. In the X+ % - variable soccer players got lower values than the other groups and also in the X+ % < .50 - variable soccer players got more positive values than the other groups.

Ideation. This cluster describes the procedures of conceptualizing the information that has been translated. In the 2AB+Art+Ay - variable, which measures the tendency to use intellectualization as a defensive tactic in affectively stressful situations, alpinists got higher values than skydivers.

## CMPS

The number of the CMPS-questionaries was; alpinists 9, skydivers 10, and soccer players 9. Alpinists got statistically significantly lower values in the Need for protecting self-esteem - variable, and higher values in the Dominance - index. Alpinists got statistically significantly higher values in the Need for exhibitionism and self-assertation - variable than skydivers. Skydivers got statistically significantly lower values in the Need of achievement - variable than the other groups. Differences between the groups in other variables were nonsignificant (Table 3).

**Table 3.** CMPS – variable averages and differences between the groups (scales from 1 to 9)

| Needvariables and indices | Group average[a] 1 | 2 | 3 | p-value[b] LSD/Tukey | Group differenes[c] |
|---|---|---|---|---|---|
| Need of Achievement | 6,22 | 3,70 | 5,78 | 0.04* | 2-1+3 |
| Need for Company and Friendship | 4,67 | 4,10 | 5,33 | 0.35 | ns. |
| Aggression | 5,33 | 5,80 | 5,33 | 0.85 | ns. |
| Need for Protecting Self-Esteem | 3,00 | 4,10 | 4,33 | 0.03* | 1-2+3 |
| Guilt Feelings | 4,56 | 5,30 | 5,00 | 0.66 | ns. |
| Need for Leadership | 6,67 | 5,30 | 4,78 | 0.16 | ns. |
| Need for Exhibitionism and Self-Assertion | 7,00 | 5,20 | 5,56 | 0.06 | 1-2 |
| Need for Independence | 5,33 | 5,90 | 4,78 | 0.37 | ns |
| Nurturance | 5,00 | 5,40 | 4,89 | 0.72 | ns. |
| Order | 4,11 | 4,40 | 3,56 | 0.46 | ns. |
| Succorance | 5,00 | 5,20 | 5,33 | 0.86 | ns. |
| INDICES | | | | | |
| Neurotic Self-Assertation | 4,56 | 4,40 | 5,22 | 0.58 | ns. |
| Dominance | 7,22 | 5,40 | 5,11 | 0.001*** | 1-2+3 |
| Agg. Non-Konf. | 5,89 | 6,10 | 6,00 | 0.94 | ns. |
| Passive Dependence | 4,44 | 4,60 | 5,11 | 0.49 | ns. |
| Sosiability | 5,11 | 4,70 | 4,89 | 0.87 | ns. |
| Acquiescence[d] | 4,00 | 4,30 | 4,22 | 0.95 | ns. |

a) 1 = Alpinists, 2 =Skydivers , 3 = Soccer players
b) * $p < .05$, ** $p < .01$, *** $p < .001$
c) Groups which differ statistically significantly. For example, 1-2+3 = Alpinists differ from skydivers and soccer players.
d) Acquiescence = Tendency to give socially acceptable answers regardless of the content of the questions.

## Flow-Experience

The number of the flow-questionaries ("evaluation of own sport activity") was; alpinists 9, skydivers 10, and soccer players 9. Skydivers got statistically significantly lower values in the Feeling of getting clear feedback for own actions - variable (p=0.003) than the other groups. Skydivers got also statistically significantly lower values in the variable, which measured the frequency of the activity (p=0.023) than (half-professional) soccer players. Other differences were statistically nonsignificant.

## Motives

The number of the "Motives of action" - questionaries was; alpinists 9, skydivers 10, and soccer players 9. Table 4 shows the data concerning the experienced importance of different motives within and between the groups.

**Table 4. Motives of action within and between the groups**

| | Alpinists | | | Skydivers | | | Soccer Players | | |
|---|---|---|---|---|---|---|---|---|---|
| Motive | Order | Aver. | Mode | Order | Aver. | Mode | Order | Aver. | Mode |
| 1. The activity in itself | **3.** | 3,0 | 3 | **2.** | 2,5 | 1 | **1.** | 2.4 | 2 |
| 2. Feelings of pleasure and using own skills | **1.** | 2,0 | 1 | **1.** | 2,1 | 3 | **2.** | 2,6 | 1 |
| 3. Development of personal skills | **2.** | 2,6 | 2 | **5.** | 3,9 | 4 | **4.** | 4,2 | 4 |
| 4. Friends and companionship | **4.** | 3,6 | 3 | **4.** | 3,6 | 5 | **3.** | 3,4 | 4 |
| 5. Comparing self and own ideals | **6.** | 5,8 | 7 | **6.** | 6,3 | 6 | **8.** | 7,2 | 8 |
| 6. Competition and comparing self to others | **8.** | 7,1 | 8 | **7.** | 7,1 | 7 | **5.** | 4,9 | 6 |
| 7. Reputation, rewards, honor | **7.** | 6,0 | 5 | **8.** | 7,3 | 8 | **7.** | 5,8 | 7 |
| 8. Emotional discharge | **5.** | 5,4 | 6 | **3.** | 3,3 | 2 | **6.** | 5,5 | 6 |

# DISCUSSION

According to the data the alpinists' information perception style and information processing is precise and detailed and and they put lots of effort in it. They reflect and focus themselves more than the other groups and this self-reflection is often critical, even negativistic. The alpinists are socially outgoing and interested in positive interactions with other people in their human relations. The skydivers seem to be more distant in their social relations and they also seem to seek, above all, personal pleasure and sensations in their sport, even at the expense of their social relations. The data indicates that the skydivers are not such 'freaks' that skydivers generally are thought to be in different media and according to many populistic opinions. They often make usual and common decisions and choices in their everyday lives.

The alpinists' style to perceive environment's information is precise and detailed. According to Exner (1993) on the background of this kind of state-like characteristic is the ambition to avoid errors and failures. Also the quality and efficiency of the information processing is high. According to the data it seems that the alpinits are able to analyze and synthesize, and to integrate the perceptions of the environment to their former experiences and knowledge in a meaningful way. According to Carrol and Johnson (1990) and Hogart (1980) an experienced alpinist has a larger scale of concepts, preconceptions, and motivational factors about the activity when the experience level gets higher. The data shows also that the alpinits do not oversimplify or narrow their stimulus field. They do not get overinvolved with the stimuli either, in other words; they do not spread their focus too widely. Also Tenenbaum and Bar-Eli (1993) stated that experienced extreme-athletes are better in distinguishing essential information from unessential and also in focusing their attention not just to the target, but also to the essential information outside the target; seeing the 'big picture'.

The data shows that the alpinists are more prone to self-inspecting and self-reflecting behaviors. This may be in connection to egocentricity and narcissistic-like characteristics in personality. Alpinists' self-reflection often contains critical and negativistic features, which is probably connected to some discrepancy between high self-value and perceived negative features of the self. Need for protecting self-esteem

was low, and it seems that the alpinits are not afraid for new challenges or failures which could hurt their self-esteem. It seems also that the high self-esteem and rational self-confidence are on the background of the alpinists' high need for dominance. Knopf (1983) has also stated that risk-athletes have high need for mastery and control.

According to the results negativistic, oppositional or even angry tendencies towards the environment are typical for the alpinists' affective features. This does not necessarily mean that the attitude will be manifest overtly in the subject's behavior, but it has some influence on the the subject's decision making and coping activities. People such as this often have difficulty sustaining deep and/or meaningful relationships with others as they are prone to be less tolerant of the routine compromises usually required in social intercourse (Exner, 1991). Also Zuckerman (1979b) found negative correlation between sensation-seeking and sociability in his study. On the other hand, the strong occurrence of the variable which indicates this kind of negativistic tendencies (S, Space) can be explained to a some extent by the alpinists' long experience and long time spent in snowy and icy environments.

Despite of the negativistic or oppositional tendencies, the data shows that the alpinists have a significant interest in people and they are capable of social intercourse. Even though; once in a while; they spend less time with other people, social relations seem to be important to them and they are probably identified by those around them as among the more gregarious in group interactions. Also Zuckerman (1979b) found that extroversion and outgoing personality have a positive correlation with sensation-seeking. On the other hand this part of the data of this study does not support Zuckerman's (1979b) results which indicated a negative correlation between sosiability and sensation-seeking. According to Montserrat, Goma, and Freixanet (1991) there were no differences in sociability between mountaineers and control group.
A need for exhibitionism emerged in the data and this probably is connected to a need for seeking publicity as well. The alpinists of this study are continuously appearing in different media due to their sport, which offers them a good way to satisfy their need for exhibitionism. Climbing is also a sport in which other people or other climbers very often are watching every little thing you do, so shocking or amazing others with own skills or actions may also have a role in satisfying the need for exhibitionism.

Eysenck and Eysenck (1978) and Kerr and Svebak (1989) postulated that alpinists' risk taking is well planned and rational. Also Slanger and Rudestam (1997) highlighted the concept of "calculated risk" often used among extreme-athletes. Within this study the sensible and rational attitude among the alpinists emerged in defensive tactics in affectively stressful situations. According to data the alpinists' way of coping with these situations was more rationalizing and intellectualizing than the other groups'.

The data shows that even though the alpinists' resources for controlling life events and stress are good, in continuous, complex, or highly ambiguous situations they can be vulnerable to some disorganisation or weaker controlling ability. In familiar situations though, they can be expected to act efficiently, in accordance with learned models and schemas. Risky situations have become familiar to them through their experience. According to Zuckerman (1979b) the experience level has a strong positive correlation with participant's way of evaluating the risk-level of the action. More experienced participant usually evaluates the risk-level lower than less experienced. On the other hand, according to Weinstein (1987), increased feeling of control is also connected to unrealistic optimism (optimistic bias). Again according to Zuckerman (1979b) sensation-seeking individuals generally evaluate many new and strange activities as less risky than individuals who are not sensation-seekers.

At the time the reseach was made the level of experienced stress was higher among the alpinists than among the other groups. This probably has some connection to the results, which indicate that in new and unexpected everyday-situations, like the test-situation, the alpinists may have some proclivity for internal impulsiveness. Also Zuckerman (1979b) found positive correlation between sensation-seeking and impulsiveness. On the other hand Montserrat, Goma, and Freixanet (1991) found no differences between mountaineers and control group in impulsiveness.

The data indicates that the skydivers' problem-solution and decision-making processes seem to be more conventional and less individualistic than was the case with the other groups. It seems that a populistic opinion in different media of extreme-athletes being weird 'freaks' is not suitable for describing the skydiver-group. They often make usual and common decisions and choices in their everyday lives.

According to the data the skydivers have resources for mature and reciprocal social intercourse, even though some tendencies of not to actively perceive or anticipate positive interactions among people or in new social situations exist. Others may perceive the skydivers as being distant and not noticeably gregarious. Also the skydivers' perceptions of social situations may be less sensitive and they might have some difficulties creating or sustaining deep or meaningful relationships with others. According to Zuckerman (1979b) extroversion and outgoing personality have positive correlation with sensation-seeking. Though, according to the data of this study the skydivers are not extroversive-like outgoing in their social relations. Also Montserrat, Goma and Freixanet (1991) found negative correlation between sensation-seeking and sociability in their study of exreme-athletes' personality.

The skydivers' self-esteem seems to be moderately high and may even contain some narcissistic-like features. These results have similar suggestions than Slanger's and Rudestam's (1997) results which indicated that high-risk group got higher values in self-efficacy scale than low-risk group. Also Macbeth (1988) stated that solo ocean cruising offers to the participant feelings of competence and independence.

Considering the motives for the activity the alpinists appreciated development of personal skills as more important motive than the other groups. This result does not support Ewert's (1994) postulation of sport-skills development not being an important motive also for experienced alpinists. Among the experienced skydivers development of personal skills was not appreciated very high as a motive. The skydivers had also low need of achievement in the CMPS personality-inquiry, so it seems that seeking for sensations, pleasure, and emotional discharge – hedonism-based motives – are essential for the skydivers. Also slanger and Rudestam (1997) stated that in skydiving, like in many other risk-sports, motives are intrinsically rewarding – for example rising the level of exitement and arousal. Again, Horwath and Zuckerman (1993) stated that sensation-seekers focus more on the enjoyment and positive affective outcomes of actions than non-sensation-seekers. Csikszentmihalyi (1975b) found that rock-climbers' most important motive was – like with the alpinists and the skydivers in this study – feelings of pleasure and using own skills, while the most important motive for basketball players was competition and comparing self to others.

In alpinism the action-field includes many elements containing danger and often risk of death. The alpinists use lots of effort for perceiving, and processing and organizing the perceived environment's information, which is essential considering the planning and the outcomes of the activity – and surviving it. Alpinists must be able to observe and to perceive the numerous risks of the activity also combining them comprehensively to each other and to their former experience and knowledge. This necessary ability develops through experience, one can talk about developping eye-for-the-game. If the alpinists are not able to perceive and focus on details, which sometimes may even seem meaningless, the outcomes may be fatal. Even though alpinists' precise and detailed perception style and information processing is essential in alpinism, it might be uneconomical in other contexts due to the big amount of used effort and energy. According to the data the alpinists' ability and way of focusing their perceptions and the quality of information processing is adequate for the demands of alpinism.

Alpinists have to have abilities and resources to focus and reflect themselves and their own actions critically and realistically for being able to act properly in difficult and dangerous situations. If an alpinist is not capable of this (s)he may evaluate his own skills and abilities unrealistically which can be dangerous and fatal for him and also for the others. Alpinists have to be aware of the level of their own skills to avoid getting into too demanding situations or environments. Alpinists also continuously spend long periods in natural environments and in isolation from modern society which probably stimulates more self-reflection than skydiving as a hobby. Although there is negativistic features in the alpinists' self-reflection, there is also narcissistic-like characteristics and egocentricity in their personality. One can state that this is adequate in alpinism; in climbing or extreme-skiing situation an alpinist first take care for himself, even though taking care for the others is also important.

There seems to emerge some discrepancy in the alpinists' interpersonal relations. In social relations they seem to be outgoing and socially active, but on the other hand there occurs some oppositional or angry tendencies toward the environment as well. Certain kind of inflexible and loyal attitude towards their way of living and their sport

may be typical for the alpinists, sometimes even at the expence of deep or meaningful social relations. However, alpinism is mostly teamwork and requires reasonable social skills from the participant. Whether you trust, or do not trust to your partner can be a question of life in alpinism. It seems that even though the alpinists may be inflexible in their attitudes and/or opinions in everyday-situations, at least in their sport they are able and ready to do compromises in the name of common good and security. Some sort of assertiveness is probably also a benefit in hard and dangerous environments.

It seems that the alpinists accept the risks they are taking as a one part of their sport. Experienced alpinists have become familiar with climbing and extreme-skiing situations and it may even be so, that unexpected situations and risk taking have become routine-like activity to them. Generally they are able to act meaningfully and rationally in risky and/or threatening situations without any considerable weakening in their stress coping abilities due to their large store of former learned schemas and models. Many of the alpinists had experiences of a friend or friends dying in mountains and of own 'close call' situations. It seems that the experienced alpinists' way to handle and cope the risk of death and emotions connected to risks is mostly rational and intellectualizing. This may even be a prerequisite for participating and doing the sport. Though, the management of the emotions and affects connected to intensive sensations and experiences may remain superficial due to this over rationalizing and possible denial of feelings. Maybe this is one explanation for the fact that the alpinists did have some indications of emotional confusion and painful emotions in their data.

Even though the skydivers' usual way of acting in everyday-situations seems to be quite conventional and not so "radical", continuous precence of fear and the risk of death makes them different from 'average-people'. They are aware of the demands of their sport and the speciality of it, the sport is certainly connected to a certain kind of pride of winning the self and the fear. This might partially explain the narcissistic-like features in the skydivers' self perception. According to the data the skydivers were less prone to self-reflection and self-focusing behaviors than the other groups. Skydiving as a hobby, when compared to alpinism, is usually more like part of everyday-living in modern and urban environments. So, skydiving probably offers less self-reflection stimulating situations or opportunities than alpinism.

One can say that skydiving is an activity or a hobby, above all, for self. Even though the security of your self and of the others is continuously and strictly looked after, compared to alpinism, the activity is not so much dependent on the others or doesn't require so much teamwork. The outcome of the activity depends always and eventually just on the participant, his/her actions, and the equipment. Even jumping in groups is mostly just for for getting more dimensions and challenges into the sport. Even though the actual jump and freefall could easily be described as some kind of extreme-like loneliness, social relations are a very important part of the skydiving activity. Skydivers often spend long times with others just waiting for the good weather. The skydivers' social relations outside the sport may suffer because of the individualistic and hedonistic, and sensation-seeking way of life.

The skydivers' willingness and/or capasity to analyze and synthesize the environments' stimuli in a meaningful way seems to be lower than was the case with the other groups. They also seem to put less effort in information processing than the others. In skydiving, when compared to alpinism and soccer, the number of the variables which have to be taken into account is quite low and limited. The actions to which one has to focus one's attention during the jump are usually well known and rehearsed beforehand and the actual time for the actions is very short. Skydiving-activity also takes place following the rules and the schemas which remain relatively unchanging every time, so the actions and conditions are quite structured by rules and regulations. There is no room for surprises or unnecessary risks in skydiving. In these circumstances, there is no need for a skydiver to handle very large amounts of information at the same moment, even though (s)he has to be prepared for the unexpected. There is one variable though, which increases the requirements of information processing; the freefall. Freefall is basically very strange environment for a human being, and it can make the actions or movements to feel very strange and difficult even though, when performed on the land, they often are very simple. With all these limitatations and requirements, it seems that the skydivers' way and willingness to process information, and the resources for that are adequate from the point of view of skyding activity.

Considering the motives again, one can say that climbing and extreme-skiing are technically very demanding. Such being the case, an alpinist has to have wide and versatile skills because the situations and conditions change continuously and often very rapidly. When the tolerance gets higher an experienced alpinist often wants to have more and more intensive experiences, which means that he also has to be more skillful and more capable. Also the alpinists in this study were quite young and motivated to develop their sport into more demanding level. The skydivers were experienced and they had reached a certain skill level. After reaching this high skill level they have been able to concentrate on intrinsically rewarding meanings of their sport. Intensive sensations and positive affective experiences are very often essential motives in skydiving, achievement and competitive motives are usually secondary.

Small sample sizes set limitations for analysis and generalization of the results. On the other hand the amount of elite-level alpinists is very small in Finland, so growing the sample sizes within this sport is difficult. One can say that the alpinist of this study represent the elite-level alpinists of Finland very well. We can also be satisfied with the representativeness of the sample of experienced skydivers, even though there is more experienced skydivers than elite-level alpinists in Finland.

Considering the results of the Rorschach Comprehensive System the total amount of responses (R) varied between the groups, which can have some effect on the results interpretation. Also the age averages varied more than would have been desirable, but according to several Rorschach CS studies this does not have any remarkable effect on the results interpretation (Exner, 1993). Another limitation is that there were two Rorschach CS code-variables (Determinants and Form Quality) which did not reach .80 value in cross-coding. The fact is, that the validity and the reliability of the Rorschach CS method is strongly based on the researcher's and cross-scorer's adequate education and experience in the method.

We did not manage to get any viable differences with the Flow-experience inquiry ("evaluation of own sport activity"). This is partly due to the weaknesses in structure and questions of the inquiry.

Former risk-sport studies have been done with other methods than methods describing subconscious processes and structures of personality. Because of this comparing this study to former studies is difficult and in some cases not adequate.

Rorschach CS and CMPS personality-inquiry describe different psychological processes and parallel interpretation of the results might be questionable. Though, according to Parker et al. (1988) Rorschach CS and inquiry-form MMPI method have comparable, reliable and valid psychometric qualities.

It is also essential to emphasize that subject's own opinions and picture of his/herself always give important information for personality interpretation. The Rorschach CS method gives information about mostly subconscious, state- and trait-like, structures and functions of personality and about ways to perceive the environment. On the other hand the CMPS personality-inquiry describes the subject's own picture of certain personality characters and ways of behavior in certain point of time and in the context of his/her life situation.

With the research approach used in this study we were not able to get valid information whether a certain character of personality developes due to participation in risk-sports or are there some persons with certain personality characters which are more prone to participate in risk-sports. Considering this a comparison research with beginners and experienced extreme-athletes would be informative. Also a follow-up study would be interesting. Participants experiences of risk and feelings of fear and the attitudes and thoughts would also be interesting research approaches. Bigger samples are also essential in extreme-sport research in the future for enhancing validity and reliability.

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**APPENDIX 1: All statistically analyzed continuous Rorschach CS variables**

| Variable | Group average[a] | | | p-value[b] LSD/ Tukey |
|---|---|---|---|---|
| | 1 | 2 | 3 | |
| R | 36,30 | 22,38 | 37,11 | 0,021 |
| Lambda | 0,39 | 0,74 | 0,91 | 0,167 |
| es | 18,10 | 9,00 | 13,67 | 0,030 |
| Adj es | 12,20 | 6,63 | 8,78 | 0,043 |
| EA | 14,30 | 8,00 | 13,94 | 0,050 |
| D | -1,30 | -0,38 | 0,11 | 0,211 |
| Adj D | 0,50 | 0,50 | 1,40 | 0,212 |
| FM | 4,70 | 2,25 | 4,00 | 0,115 |
| m | 3,50 | 2,63 | 4,44 | 0,308 |
| C' | 3,70 | 2,00 | 2,22 | 0,123 |
| Y | 4,00 | 1,13 | 2,11 | 0,048 |
| V | 1,50 | 0,50 | 0,56 | 0,135 |
| T | 0,70 | 0,50 | 0,33 | 0,538 |
| Pure C | 1,00 | 1,50 | 2,22 | 0,321 |
| Afr | 0,47 | 0,54 | 0,49 | 0,719 |
| S | 6,60 | 3,38 | 3,89 | 0,012 |
| Blends/R | 0,33 | 0,16 | 0,18 | 0,016 |
| CP | 0,20 | 0,00 | 0,00 | 0,173 |
| COP | 2,20 | 0,50 | 1,00 | 0,022 |
| AG | 1,60 | 0,88 | 2,00 | 0,240 |
| FD | 3,80 | 0,38 | 1,78 | 0,007 |
| Isolate/R | 0,31 | 0,33 | 0,29 | 0,802 |
| 2 AB+Art+Ay | 6,30 | 3,00 | 5,89 | 0,086 |
| M- | 0,90 | 0,25 | 0,89 | 0,317 |
| M none | 0,10 | 0,13 | 0,44 | 0,156 |
| Sum6 | 7,00 | 3,13 | 4,67 | 0,208 |
| Lvl-2 | 1,25 | 0,25 | 0,44 | 0,390 |
| Wsum6 | 23,50 | 8,25 | 12,44 | 0,242 |
| P | 6,00 | 5,38 | 6,00 | 0,703 |
| X+% | 0,48 | 0,57 | 0,33 | 0,009 |
| F+% | 0,43 | 0,44 | 0,33 | 0,594 |
| Xu% | 0,36 | 0,25 | 0,43 | 0,008 |
| X-% | 0,14 | 0,14 | 0,18 | 0,578 |
| S-% | 0,19 | 0,18 | 0,08 | 0,576 |
| Zf | 19,30 | 10,88 | 19,44 | 0,019 |
| Zd | 4,75 | -0,50 | -4,28 | 0,003 |
| DQ+ | 10,80 | 4,13 | 9,22 | 0,040 |
| DQv | 3,70 | 4,00 | 6,30 | 0,267 |
| 3r+(2)/R | 0,50 | 0,42 | 0,35 | 0,169 |
| FD | 3,80 | 0,38 | 1,78 | 0,007 |
| An+Xy | 1,70 | 1,50 | 1,10 | 0,603 |
| MOR | 2,10 | 1,88 | 1,78 | 0,894 |
| PER | 3,90 | 2,88 | 2,33 | 0,488 |
| PSV | 0,60 | 0,25 | 0,67 | 0,636 |

a) 1 = alpinists, 2 = skydivers, 3 = soccer players
b) The probability for average deviation between the groups.

## APPENDIX 2: All statistically analyzed dichotomic Rorschach CS variables

| Variable | %-frecuences in groups[a] | | | | | | p-value[b] |
|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3 | | G-square |
| | yes | no | yes | no | yes | no | |
| W > 12 | 40 | 60 | 13 | 87 | 78 | 22 | 0,018 |
| Lambda > .99 | 0 | 100 | 37 | 63 | 33 | 67 | 0,038 |
| Lambda < .31 | 30 | 70 | 25 | 75 | 22 | 78 | 0,926 |
| Eb-style: | | | | | | | |
| Introversive | 30 | 70 | 25 | 75 | 33 | 67 | 0,931 |
| Pervasive | 20 | 80 | 25 | 75 | 11 | 89 | 0,744 |
| Ambitent | 30 | 70 | 37 | 63 | 22 | 78 | 0,787 |
| Extratensive | 40 | 60 | 37 | 63 | 44 | 56 | 0,957 |
| Pervasive | 10 | 90 | 25 | 75 | 22 | 78 | 0,657 |
| eb left < right | 60 | 40 | 37 | 63 | 22 | 78 | 0,232 |
| eb left > 6 | 60 | 40 | 25 | 75 | 67 | 33 | 0,176 |
| D score > 1 | 10 | 90 | 13 | 87 | 0 | 100 | 0,421 |
| D score > 0 | 20 | 80 | 12 | 88 | 22 | 78 | 0,662 |
| D score = 0 | 30 | 70 | 50 | 50 | 67 | 33 | 0,269 |
| D score < 0 | 50 | 50 | 37 | 63 | 11 | 89 | 0,162 |
| D-score < -1 | 50 | 50 | 25 | 75 | 0 | 100 | 0,018 |
| Adj D > 1 | 20 | 80 | 12 | 88 | 55 | 45 | 0,110 |
| Adj D > 0 | 40 | 60 | 25 | 75 | 77 | 23 | 0,067 |
| Adj D = 0 | 40 | 60 | 62 | 38 | 22 | 78 | 0,232 |
| Adj D < 0 | 20 | 80 | 13 | 87 | 0 | 100 | 0,247 |
| Adj D < -1 | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |
| V > 0 | 80 | 20 | 25 | 75 | 33 | 67 | 0,031 |
| T= 0 | 50 | 50 | 63 | 37 | 67 | 33 | 0,743 |
| T > 1 | 20 | 80 | 13 | 87 | 0 | 100 | 0,247 |
| FC > (CF+C) + 2 | 30 | 70 | 13 | 87 | 0 | 100 | 0,110 |
| FC > (CF+C) + 1 | 40 | 60 | 13 | 87 | 11 | 89 | 0,242 |
| (CF+C) > FC + 1 | 50 | 50 | 38 | 62 | 67 | 33 | 0,475 |
| (CF+C) > FC + 2 | 40 | 60 | 25 | 75 | 56 | 44 | 0,433 |
| Afr > .85 | 0 | 100 | 13 | 87 | 11 | 89 | 0,377 |
| Afr < .53 | 60 | 40 | 63 | 37 | 67 | 33 | 0,955 |
| Afr < .44 | 60 | 40 | 25 | 75 | 33 | 67 | 0,275 |
| S ≥ 4 + at least 1 S in IV-X | 80 | 20 | 50 | 50 | 44 | 56 | 0,219 |
| Blends with 3 det. > 1/4 and/ | | | | | | | |
| or Blends with at least 4 det > 0 | 40 | 60 | 13 | 87 | 33 | 67 | 0,393 |
| Shd-Blends > 0 | 50 | 50 | 0 | 100 | 11 | 89 | 0,015 |
| Shd Blends with no Y > 0 | 20 | 80 | 0 | 100 | 0 | 100 | 0,119 |
| Col - Shd Blends > 0 | 60 | 40 | 13 | 87 | 44 | 56 | 0,098 |
| Col - Shd Blends with no Y > 0 | 50 | 50 | 0 | 100 | 22 | 78 | 0,024 |
| CP > 0 | 20 | 80 | 0 | 100 | 0 | 100 | 0,119 |
| Pure C > 0 | 50 | 50 | 63 | 37 | 78 | 22 | 0,447 |
| Pure C > 1 | 30 | 70 | 25 | 75 | 67 | 33 | 0,148 |
| COP = 0 & AG = 0/1 | 0 | 100 | 63 | 37 | 22 | 78 | 0,005 |
| COP < 2 & AG = 2 | 10 | 90 | 25 | 75 | 0 | 100 | 0,188 |
| COP < 3 & AG > 2 | 30 | 70 | 0 | 100 | 33 | 67 | 0,085 |
| COP < 3 & AG < 2 | 20 | 80 | 63 | 37 | 44 | 56 | 0,170 |
| COP = 2/3 & AG = 2 | 10 | 90 | 13 | 87 | 22 | 78 | 0,746 |
| COP ≥ 3 & AG < 2 or | | | | | | | |
| COP > 3 & AG ≤ 2 | 30 | 70 | 0 | 100 | 0 | 100 | 0,037 |
| COP ≥ 3 & AG > 2 | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |
| Food > 0 | 40 | 60 | 13 | 87 | 11 | 89 | 0,242 |
| Isolate / R > .25 | 70 | 30 | 75 | 25 | 78 | 22 | 0,926 |
| Isolate / R > .33 | 20 | 80 | 63 | 37 | 33 | 67 | 0,170 |
| H + (H) + Hd + (Hd) < 5 | 20 | 80 | 38 | 62 | 22 | 78 | 0,679 |
| H + (H) + Hd + (Hd) > 7 | 60 | 40 | 0 | 100 | 56 | 44 | 0,005 |
| Pure H = 0 | 10 | 90 | 13 | 87 | 11 | 89 | 0,986 |
| (HHd) + (AAd) > 3 | 60 | 40 | 25 | 75 | 22 | 78 | 0,165 |
| H + A : Hd + Ad left/4 < right | 80 | 20 | 63 | 37 | 89 | 11 | 0,420 |
| p > a+1 | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |
| a:p, a/p more than 3 x | | | | | | | |
| bigger than other | 60 | 40 | 50 | 50 | 33 | 67 | 0,500 |
| Mp > Ma | 20 | 80 | 0 | 100 | 33 | 67 | 0,110 |
| 2 Ab+Art+Ay ≥ 6 | 60 | 40 | 13 | 87 | 44 | 56 | 0,098 |
| M - > 0 | 40 | 60 | 25 | 75 | 67 | 33 | 0,204 |
| M none > 2 | 10 | 90 | 13 | 87 | 44 | 56 | 0,157 |
| M - + M none ≥2 | 30 | 70 | 0 | 100 | 33 | 67 | 0,085 |
| Sum6 > 0 | 100 | 0 | 100 | 0 | 100 | 0 | 1,000 |
| Sum6 > 6 | 30 | 70 | 0 | 100 | 22 | 78 | 0,127 |

| Variable | %-frecuences in groups[a] | | | | | | p-value[b] G-square |
|---|---|---|---|---|---|---|---|
| | 1 | | 2 | | 3 | | |
| | yes | no | yes | no | yes | no | |
| Wsum6 > 11 | 60 | 40 | 13 | 87 | 56 | 44 | 0,098 |
| Lvl-2 > 0 | 50 | 50 | 25 | 75 | 44 | 56 | 0,529 |
| Wsum6 >11 & Lvl2 > 0 | 20 | 80 | 13 | 87 | 22 | 78 | 0,859 |
| Pop < 6 | 50 | 50 | 63 | 37 | 33 | 67 | 0,475 |
| X+% < .70 | 90 | 10 | 88 | 12 | 100 | 0 | 0,421 |
| X+% < .50 | 70 | 30 | 25 | 75 | 100 | 0 | 0,001 |
| X+% < .70 & L > 1.0 | 0 | 100 | 25 | 75 | 11 | 89 | 0,169 |
| AG = 0 | 20 | 80 | 50 | 50 | 22 | 78 | 0,336 |
| AG > 2 | 30 | 70 | 0 | 100 | 33 | 67 | 0,085 |
| X+% < .70 & P < 6 | 50 | 50 | 50 | 50 | 33 | 67 | 0,710 |
| F+% < .70 & L >1.0 | 0 | 100 | 25 | 75 | 11 | 89 | 0,169 |
| Xu% >.20 | 90 | 10 | 75 | 25 | 100 | 0 | 0,188 |
| X+% < .70 & Xu% >.20 | 90 | 10 | 75 | 25 | 100 | 0 | 0,188 |
| Xu% >.30 | 80 | 20 | 13 | 87 | 100 | 0 | 0,000 |
| X-% >.15 | 50 | 50 | 25 | 75 | 56 | 44 | 0,393 |
| X-% >.20 | 10 | 90 | 13 | 87 | 33 | 67 | 0,389 |
| S-%>.40 | 20 | 80 | 13 | 87 | 0 | 100 | 0,247 |
| Zd< -3.0 | 10 | 90 | 25 | 75 | 44 | 56 | 0,219 |
| Zd > 3.0 | 60 | 40 | 0 | 100 | 0 | 100 | 0,000 |
| Zd > 5.0 | 60 | 40 | 0 | 100 | 0 | 100 | 0,000 |
| Zf > 13 | 90 | 10 | 25 | 75 | 67 | 33 | 0,013 |
| Zf > 20 | 40 | 60 | 0 | 100 | 44 | 56 | 0,030 |
| Zf < 9 | 0 | 100 | 50 | 50 | 11 | 89 | 0,014 |
| W > D | 50 | 50 | 38 | 62 | 44 | 56 | 0,868 |
| W > 12 | 40 | 60 | 13 | 87 | 78 | 22 | 0,018 |
| Zf >13 & W > D+Dd | 40 | 60 | 13 | 87 | 22 | 78 | 0,391 |
| W:M > ave.EBstyle | 30 | 70 | 75 | 25 | 67 | 33 | 0,109 |
| DQ+> 9 | 70 | 30 | 0 | 100 | 33 | 67 | 0,003 |
| DQv > 3 | 50 | 50 | 38 | 62 | 78 | 22 | 0,211 |
| 3r+(2)/R > .45 | 70 | 30 | 25 | 75 | 22 | 78 | 0,057 |
| 3r+(2)/R > .55 | 40 | 60 | 13 | 87 | 11 | 89 | 0,242 |
| 3r+(2)/R < .32 | 20 | 80 | 25 | 75 | 33 | 67 | 0,802 |
| Fr+rF > 0 | 60 | 40 | 75 | 25 | 44 | 56 | 0,433 |
| Fr+rF >2 | 50 | 50 | 13 | 87 | 11 | 89 | 0,094 |
| FD > 2 | 70 | 30 | 0 | 100 | 11 | 89 | 0,000 |
| FD > 2 & V > 0 | 70 | 30 | 0 | 100 | 0 | 100 | 0,000 |
| FV+VF+V+FD > 2 | 80 | 20 | 13 | 87 | 22 | 78 | 0,004 |
| An+Xy > 2 | 20 | 80 | 25 | 75 | 11 | 89 | 0,744 |
| MOR > 2 | 40 | 60 | 25 | 75 | 33 | 67 | 0,796 |
| PER > 4 | 50 | 50 | 25 | 75 | 22 | 78 | 0,372 |
| PSV > 2 | 10 | 90 | 0 | 100 | 11 | 89 | 0,478 |
| S-Con YES | 30 | 70 | 0 | 100 | 11 | 89 | 0,125 |
| S-Con = 8 | 10 | 90 | 0 | 100 | 11 | 89 | 0,478 |
| S-Con = 9 | 20 | 80 | 0 | 100 | 0 | 100 | 0,119 |
| S-Con > 9 | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |
| SCZI YES | 10 | 90 | 0 | 100 | 11 | 89 | 0,478 |
| SCZI = 4 | 0 | 100 | 0 | 100 | 11 | 89 | 0,321 |
| SCZI = 5 | 10 | 90 | 0 | 100 | 0 | 100 | 0,358 |
| SCZI = 6 | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |
| DEPI YES | 80 | 20 | 38 | 62 | 33 | 67 | 0,170 |
| DEPI = 5 | 40 | 60 | 13 | 87 | 56 | 44 | 0,154 |
| DEPI = 6 | 30 | 70 | 25 | 75 | 11 | 89 | 0,574 |
| DEPI = 7 | 10 | 90 | 0 | 100 | 0 | 100 | 0,358 |
| CDI YES | 20 | 80 | 25 | 75 | 0 | 100 | 0,161 |
| CDI = 4 | 20 | 80 | 0 | 100 | 0 | 100 | 0,119 |
| CDI = 5 | 0 | 100 | 25 | 75 | 0 | 100 | 0,072 |
| HVI YES | 40 | 60 | 13 | 87 | 22 | 78 | 0,391 |
| OBS YES | 0 | 100 | 0 | 100 | 0 | 100 | 1,000 |

a) 1 = alpinists, 2 = skydivers, 3 = soccer players

b) The probability for average deviation between the groups.

APPENDIX 3:

MOTIVES OF ACTIONS

NAME:_____

**Below is a list of eight reasons (motives) for your participation in your sport. These motives are not in any particular order. Please, read them all thoroughly through and then set them in the order of importance according to your own opinions ant thoughts. After the most important motive for you draw number 1, after the second important motive number 2, etc...**

**Answer independently and truthfully and according to your own thoughts only. There is not any "right" order for these motives, only your personal experience matters. All the information is confidential. Please, read all the options through and think about them before you start answering.**

*** The activity in itself** _____

*** Feelings of pleasure and using own skills** _____

*** Development of personal skills** _____

*** Friends and companionship** _____

*** Comparing self and own ideals** _____

*** Competition and comparing self to others** _____

*** Reputation, rewards, honor, respect** _____

*** Emotional discharge** _____

THANK YOU FOR YOUR ANSWERS !

## APPENDIX 4.

## EVALUATION OF OWN SPORT ACTIVITY

**The purpose of this inquiry is to examine experiences of different athletes in different sports during the sport activity.**

**Please, read first the whole questionary and instructions thoroughly through before you start answering. Take enough time for answering and think each question carefully. There is not any tricks or any "right" answers in the questionnary, only your personal thoughts and experiences matter. Answer independently and truthfully and according to your own experiences only.**

**All the information is fully confidential and only the researchers will see the answers.**

**Sampo Kettunen** **Marko Saukko**

**Name** _____

**The sport I am participating** _____

**How often do you participate in this sport? (If your participation is periodical, for example summer/winter, describe how often do you participate in the sport during the active season. Describe also the nature of the active period, for example the months of participation, and the nature of your participation.)**

**1 Once in a month or less**
**2 Few times in a month**
**3 Once in a week**
**4 Few times in a week**
**5 Once a day or more**

_____
_____
_____
_____
_____

**Please, read first the whole questionary thoroughly through before you start answering.** 

1. **Do you ever feel during the sport activity that your awareness of other things and conditions (than the sport activity) surrounding you narrows or fades away?** Then you do not notice or think about things that you usually are aware of, like other people talk, loud noices, time going by, hunger, thirst, that day's events, made appointments or inconveniences of your posture or of the environment.

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often in this activity do you feel that your awareness narrows in the way mentioned abowe?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

2. **Do you concentrate on the activity so strongly while doing it, that you feel totally focused on the activity?** Then you do not notice or think about things that you usually are aware of, like other people talk, loud noices, time going by, hunger, thirst, that day's events, made appointments or inconveniences of your posture or of the environment.

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often do you feel so focused on that activity?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

3. **Do you feel that your sport skills have become like automatic to you, that you do not have to put very much effort in the activity and the activity feels effortless?**

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often do you feel such effortlessness and easyness during the activity?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

4. **Do you feel being in control during the activity?** Like you, above all, control the happenings and are responsible for the activity and the outcomes of it

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often in this activity do you feel this kind of control?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

5a. **Do you feel during the activity that the goals of the activity are clear and logical?**

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often in this activity do you feel this way?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

5b. **During the activity, do you feel that you get clear feedback from your actions?**

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often during the activity do you feel that you get clear feedback?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

6. **Do you feel that you are participating the sport, above all, for the activity itself and because you like it** (and you would do that sport even if you did not get any rewards or privileges for it and even if you had to do some sacrifices for it)?

(choose 1 or 2) 1 = YES 2 = NO

If you answered "yes", how often in this activity do you feel that you are doing it for the activity itself ?

(choose one option)

1 Once in a month or less
2 Few times in a month
3 Once in a week
4 Few times in a week
5 Once a day or more

THANK YOU FOR YOUR ANSWERS

# APPENDIX 5.

## BASIC INFORMATION SHEET

**Name:**_____

**Address:**_____

**Telefone:**_____ **Age:**_____ **Occupation:**_____

**Which sport(s) do you participate. Put them in the order of importance, and how many days in a year do you participate in certain sport approximately?**

**1:**_____

**2:**_____

**3:**_____

**4:**_____

**5:**_____

**Years of experience in the(se) sport(s):**

**1:**_____**2:**_____**3:**_____**4:**_____**5:**_____

**Do you have any goals in the(se) sport(s)? If you have, what?**

_____

_____

_____

_____

**What do you consider as your best achievements in the(se) sport(s)?**

_____

_____

_____

_____

**THANK YOU FOR PARTICIPATING IN THIS RESEARCH!**