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Outdoor Activities in Educational and Recreational Programmes

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November 22-25, 2012
Faculty of Physical Education and Sport Charles University
Prague, Czech Republic

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Faculty of Physical Education and Sport

Charles University at Prague, Czech Republic

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INVESTMENTS IN EDUCATION DEVELOPMENT

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SESSION 1
OUTDOR ACTIVITIES AND HEALTH

Walking in nature

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Aim. Many recent studies are concerned about the dramatic increase in rates of physical inactivity, overweight, and obesity. Overweight and obesity are associated with increased health risks for chronic diseases and disorders, including coronary heart disease, type 2 diabetes, various cancers (e.g., endometrial, breast, and colon cancers), among others. Physical activity, at recommended levels, mitigates many of these health risks, regardless of weight class. It may be conclude that: 1) Regular physical activity clearly attenuates many of the health risks associated with overweight and obesity; 2) Physical activity appears to not only attenuate the health risks of overweight and obesity, but active obese individuals have lower morbidity and mortality than normal weight individuals who are sedentary; and 3) Inactivity and low cardiorespiratory fitness are as important as overweight and obesity as mortality predictors. There is strong evidence of an inverse, linear relationship between physical activity and reductions in all-cause mortality, total cardiovascular and coronary heart disease incidence and mortality, Type 2 diabetes mellitus, and colon cancer. This linear relationship suggests that as people move away from sedentary lifestyles, the health benefits of being physically active accumulate immediately and continue to accrue as they become more physically active. Given the health benefits of physical activity, promoting physically active lifestyles is a primary focus of many public health programs. As described by ACSM recommended physical activity is an accumulation of at least 30 minutes of moderate physical activity or 20 minutes of vigorous physical activity most days of the week.

Methods. Movement activity must be simple, cheap, affordable, effective and safe. Outdoors activities realized in parks, wood, mountains and other infrastructure, including non-motorized trail corridors, bikeways, and sidewalks for example, provide important opportunities to meet recommended daily levels of physical activity. Hiking is proving to be one of the most effective forms of motor activities in outdoor environment or in the mountains. The daily recommended number of steps to ensure health benefit, vary depending on altitude in the range 5 to 12 thousand steps. The upper number applies to a height of up to 400 m flat terrain, and bottom for altitude ranged from 1200 to 2000 m.

Results. On the basis of our measurements of a 10 000 steps program at an altitude of around 300 m over 5 months, energy content of 6270±1212 kJ/week in men, and 6103±1000 kJ/week in women can be achieved for healthy men (n=68, mean age = 45.7±3.6 years) and women (27, 40.2±4.9) of middle age and increased fitness by about 17% and reduction of overweight or obesity of around 10%, which corresponds to approx. 30% reduction of the above mentioned health risks.

Conclusion. In conclusion it can be stated that hiking on flat terrain can be considered one of the fundamental outdoor activities for improvement of physical fitness state and body mass influence and thus to reduce the health risks factors of contemporary lifestyle.

The study was supported by grant of Ministry of Physical Education and Sport Czech Republic MSM 0021620864.

The effect of arm work intensity on energy cost during Nordic walking

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Aim. Walking with poles or Nordic Walking (NW) is considered as an activity with a higher energy cost than simple walking (W). The differences in the energy cost between W and NW mentioned in the literature vary between 0 - 30 %. This variability is accounted to the speed of locomotion, the poles length, the type or inclination of the terrain. Our assumption was that the arm work during the locomotion will play a key role in energy cost of NW. The aim of the study was to assess the arm work intensity during walking with poles on energy expenditure in active males.

Methods. The research sample consisted of 14 aerobically active males (24.1 ± 1.8 yrs, 74.3 ± 6.4 kg, 179.1 ± 5.4 cm). Oxygen consumption (Metalyzer, Cortex, Germany) was used to assess energy cost during W and NW with moderate and high arm work intensity. The testing protocol consisted of a 4 minute walk at a 6 km/h speed on a treadmill in every experimental situation (0 % and 10 %; W, NW with moderate arm work intensity, NW with high arm work intensity). The intensity of arm work was set on a subjective scale 1-5, where moderate arm work intensity corresponded to 1-2 and high arm work intensity to 4-5. The differences between W, NW with moderate and high arm intensity were assessed by repeated measure ANOVA.

Results. We observed no significant ($p = 0.12$) increase in the oxygen consumption between W and NW with moderate arm work intensity at 10 % inclination. At 0 % inclination, we found statistically significant ($p=0.001$) but practically not significant (0.1 l·min-1) increase in oxygen consumption between W and NW with moderate arm work intensity. Contrary we found significant ($p < 0.001$) increase between NW with moderate and high arm work intensity for both slopes (0 % inclination W 1.49 ± 0.13 l·min-1, NW moderate arm work intensity 1.59 ± 0.17 l·min-1, NW high arm work intensity 1.89 ± 0.17 l·min-1 ; 10 % inclination W 2.51 ± 0.18 l·min-1 NW moderate arm work intensity 2.55 ± 0.23 l·min-1, NW high arm work intensity 2.80 ± 0.22 l·min-1.

Conclusion. The study showed that the arm work intensity is one of the key factors influencing the energy cost of NW. NW with low arm work intensity was equally demanding in energy cost as walking without poles. The higher energy cost appeared only with high intensity arm work. The results may be considered by trainers or therapists in NW programs prescription. The main limitation of the study was the sample of aerobically trained males which does not enable to generalize the results on a larger population.

The study was supported by grant of Ministry of Physical Education and Sport Czech Republic MSM 0021620864.

Influence of physical effort, on selected physiological and anthropometrical parameters, during mountain hiking in Karkonosze

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Aim. Mountain hiking is still a very popular form of recreation all over the world. Physical effort in high altitudes (above 4000m) brings observable changes in humans. The aim of our research was to analyze if physical effort, during mountain hiking in lower mountain environments, that is below 2000m, has any observable influence on humans.

Methods. A series of physiological and anthropometrical tests were made. The test group was assembled from students of Tourism and Recreation at the University School of Physical Education in Wroclaw, aged 20-29. The group undertook a six day mountain hiking camp in Karkonosze. The research was divided into three stages. The first stage was in the Physical Effort Research Laboratory in the faculty of Physiology and Biochemistry of University School of Physical Education in Wroclaw. Several physical efficiency tests ("Progressive test" and "10 minute cycling test") and anthropometrical and somatic measurements were undertaken. The second stage was carried out in terrain and was based on every day anthropometrical measurements, 24 hour heart rate monitoring and measurements of lactic acid levels on selected parts of the route. The daily distance was set for min 10 km and max 25 km, within min 200 m and max 700 m of vertical distance. The whole camp route was M= 13,6 km long and the vertical distance was M= 330m. On the last day of the hiking camp the physical efficiency tests were repeated. The third stage was carried out on the 50th day after the camp to review if somatic and physiological parameters lasted.

Results. Findings indicate changes in physiological and anthropometrical parameters. The results can justify that physical effort in mountain environment has got an observable influence on the physical efficiency level. Six day mountain hiking caused changes in those parameters which can be notifying about rising physical efficiency; changes in systolic blood pressure measurements during 10 minute cycling test, before the camp (M=125,7 mmHg, M=152,4 mmHg, M=127,2 mmHg) and after the camp (M=120,2 mmHg, M=149,7 mmHg, M=121,5 mmHg). The same direction of changes can be observed in heart rate measurements (M=76,1 bpm, M=137,1 bpm, M=98,1 bpm) before the camp and (M=72,4 bpm, M=132,5 bpm, M=88,3 bpm) after the camp. On every stage of the tests, values of heart rate and blood pressure were lower after hiking. There was also a shorter time of heart rate coming back to its restitution values (M=5,30 min). The measurements of body composition prove that physical effort, in mountain environment, can cause fat tissue reduction. There were observed several changes in anthropometrical measurements. During the camp there was no body mass reduction observed (M=64,3 kg) before and (M=64,2 kg) after the camp. This could be caused by the higher level of water in the participants (M=59,6%) before and (M=60%) after the camp. There was also observed a lower level of fat weight (M=0,4 kg), and growth of nonfat mass (M=0,3 kg).

Conclusion. Physical effort in mountain environments, during hiking has got an observable influence on some physiological and anthropometrical parameters.

Influence of kayaking on postural function disorders

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Aim. Postural function disorder represents a defective body posture, muscle imbalance, of the musculoskeletal system. Apart from lack of physical activity, one-sided overloading of the musculoskeletal system without optimal compensation often causes the postural disorder. One of the first manifestations of postural function disorder is a poor body posture when growing. Muscle imbalance worsens the economy of movement, which leads to increase in exhaustion and decreased efficiency. Gradually formed degenerative changes in the spine are associated with unpleasant pain accompanying vertebral problems. The problem of kayakers' posture may be related due to the one-sided overloading and the resulting creation of muscle imbalance. Within the upper cross syndrome it is possible to see a clinical picture which shows a significant kyphotic arch, shoulder protraction and forward head posture with enhanced cervical lordosis. The aim of this paper is to contribute to the evaluation of body posture in kayaking.

Methods. The research was carried out on 30 men, average age 19.9 years, standard deviation 2.9, max. age 27, minimal age 15, with 11-year racing experience. The research was carried out in April 2011. The instrument used for data collection was a method of basic kinesiological examination when symptoms of aberration in posture were observed by the Jaroš and Lomíček´s complex test. We observed and rated the posture of individual body parts and their mutual position separately in anteroposterior and lateral view when standing. When evaluating the individual segments of the spine, marks from 1 to 4 /1 - excellent, 2 - good, 3 - defective, 4 - very bad posture/ were assigned.

Results. The average result of the overall evaluation of the body posture of the kayakers after the sum of all five rated segments of the spine /each segment of the spine with marks from 1 to 4/ sample is 8.9 with a verbal assessment as a good posture. Nevertheless, these results are rather on the border of defective posture. Kayakers reached the lowest values, which indicate perfect posture in the part of the test which assesses abdomen and pelvis inclination and evaluation of body posture in frontal plane with the average value of 1.5. Worse results are observed in the evaluation of chest with the average value of 1.9 and posture of the head and neck with the average value of 1.7. On the contrary, the highest average value of 2.3 is close to the defective posture we found when evaluating the curve of the back from lateral view.

Conclusion. When evaluating the body posture using a basic kinesiological examination by the Jaroš and Lomíček's complex test we found that kayakers have good body posture. When evaluating the individual spine segments we observed the biggest symptom of aberration referring to a kyphotic posture, i.e. occurrence of upper cross syndrome. For the coaches of sport clubs of speed canoeing - kayaking, we recommended compensation exercises dealing with the correction of muscle imbalance within the upper cross syndrome /releasing and stretching the upper part of trapezius muscle, scapula elevator, head bender, head elevators and pectoral muscles and strengthening of the deep neck flexors, scapula fixators, rhombic muscle, lower and middle part of trapezius muscle and the serratus anterior muscle. An integral part of the compensation process should be an activation of the deep stabilizing system of the spine.

Physiological aspects of recreational horse riding

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Aim. The aim of this study was to monitor the level of load during recreational riding in various kinds of gaits and to find out the differences between two groups of beginners and advanced recreational riders.

Methods. Eighteen horse-riders were monitored in field research (14 women, 4 men) during three kinds of horse gaits: step, trot and canter. The average age was 26 (15 – 60 years). The horse-riders were divided into two groups (beginners and advanced horse-riders) according to their level of skills and then evaluated by two experts. The research was carried out in a large outdoor fold with mixed surface (lawn, earth and sand). For the research, a seven-year-old 'quiet' horse was chosen. The subjects were monitored during step, light trot and work canter. The average speed for step was 5.2 kph, for trot 10.2 kph and for canter 14.9 kph for both groups. The test consists of 5-minute riding in step, 5-minute rest, 5 minutes in trot, 5 minutes of rest and 5 minutes in canter. Sporttester Polar 800 with modul G3 was used for monitoring dependent variable: heart rate and independent variable horse speed. Further independent variables were kinds of horse gait and group of horseman. HRmax was calculated with the help of formula 220-age. Simple descriptive statistics and t-test were used.

Results. For all kind of horse gaits, higher values of HRmean for beginners were found. There was a tendency for decreasing difference in HRmean between both groups with increasing speed of the horse movement. The highest difference between groups was found for step (29.6 %), for trot 14.2 %, for canter only 3 %. The value of HRmean for step reached 56.5 % of HRmax for advanced horse-riders, which corresponds to fast walk on the flat, and for beginners it reached 72.2 % of HRmax, which corresponds to slow run. During the fastest gait canter, the difference of both groups was insignificant; the beginners reached 86.4 % of HRmax and the advanced 84.8 %.

Conclusion. Higher HR for two slower horse gaits was reached by the group of beginners, as a consequence of their lower skill level and a higher level of emotion. During all the horse gaits, sufficient load for maintaining or developing condition, mainly aerobic endurance was reached. The highest difference of HR was found between step and trot for both groups. During trot, the movement of horse-riders is in bigger range and the lower extremities start to do more intensive work.

Prevalence and attitudes to cannabis drugs intake in outdoor activity students

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Aim. Drug intake is a serious health and social problem of current society. One of the most often used substances is cannabis. These drugs have serious health impact on the human organism especially with long-term usage, particularly damage to the breathing system and cognitive deficits - damage of memory function and concentration. The objective of our research was an evaluation of the prevalence and attitudes to cannabis intake in Outdoor Activity students at the Faculty of Education in Usti nad Labem. Anecdotal evidence indicated an increased intake of soft and hard drugs among the participants of these outdoor physical activities.

Methods. As a research instrument we used the Czech version of the European Model Questionnaire (EMQ), recommended by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). We used the questions focused on cannabis substances intake answered by Outdoor Activity students (n=46).

Results. The research showed that all the students knew somebody who uses substances from cannabis. 67,4 % of them already used marihuana or hashish, in the last 12 months it was 41,3 % and in last 30 days 28,3 % confessed to the use of these drugs. The frequency of consumption in the last month was most often mentioned as the use of the drug at least once per week. An interesting opinion is that 82,6 % of respondents mostly or absolutely agree with the legalization of cannabis drugs and none are against the occasional use of marihuana or hashish.

Conclusion. The acquired data confirmed an increased intake and tolerance to the intake of cannabis in the students of Outdoor Activities. These numbers are significantly higher than those found out in the European population in the age group 15-34 years. In the time frame of the intake of cannabis it is only 6,6 % in the last month, 12,1 % in the last year and 32,0 % in the lifetime. The prevalence in our students is also higher than in the Czech Republic. At the same time the Czech Republic shows the highest numbers in Europe. Intake in the last month is presented in this age group by 8,6 %, in the last year by 21,6 % and in the lifetime by 45,5 % of population. It is necessary to find out whether the drug intake during the outdoor activities is connected to the effort to improve sport performance, stimulate the experience of some adrenaline activity or are there external influences of this specific sport field? Education for these students in the subject of Anti-doping may address problems of drug intake in outdoor activities.

Outdoor activities and health of seniors: influence of Nordic walking on their life quality

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Aim. Among the most important fears related to advancing age is low life quality conditioned by health. However, the influence of suitable physical activity can result in positive changes of functional and health condition. Appropriate physical activity also suppresses the origin and impact of risk factors which negatively influence life quality, accompany the aging process, and may lead to early death e.g. atherosclerosis, obesity, osteoporosis. Physical activity also influences other factors of life quality which are emotions, independence, feeling of social necessity and good living. An inseparable part of health is also a psychosocial peace which is a result of positive emotional experiences which should be a part of every program of physical activity. Technically correctly Nordic walking with recommended higher intensity has several positive influences on the life health conditioned quality of seniors. The aim of this paper is to contribute to the positive assessment of seniors' life quality influenced by physical activity, in particular Nordic walking.

Methods. For the assessment of life quality we used a questionnaire specifically focused on the assessment of life quality in old age WHOQOL-OLD. The questionnaire consists of 24 questions for subjective assessment of one's life by the offered scale of possible answers from 1 to 5 /absolutely not, a little, medium, a lot, at the maximum. The intervention was a professionally individually monitored 8-week fitness program which used outdoor activities – Nordic walking. Before the intervention a questionnaire survey was carried out with all 31 respondents, 24 women and 7 men, with average age 77 years, standard deviation 3.5, max/min 84/71. The seniors were split into an experimental (n=15) and control group (n=16). We intentionally included in the experimental group those who showed interest and their health enable them to perform Nordic walking. After the intervention program all the seniors filled the questionnaire WHOQOL-OLD again.

Results. The findings indicated that Nordic walking positively affects the perception of degradation of senses, everyday life of the respondent and the rate of the impact on the loss e.g. of hearing, sight, taste, smell, or touch in the ability to engage in various activities. At the same time it led to the improvement of perception of making free decisions about their issues, their future and the positive shift in the perception that people around the respondent respect freedom of decision and dedication to the things they would like to do. The intervention also positively influenced the satisfaction with their capabilities to achieve something in their lives and the perception that the seniors in their lives get the credit they deserve. Also the number of those who think they have enough daily activities increased and they were satisfied with what they had achieved in their life. The number of individuals satisfied with spending their time increased significantly and they were satisfied with the possibilities of participation in social /local/ events. Because we intentionally included those, who showed interest and its health enable them to perform Nordic walking in the experimental group, we have to allow for the possibility, that the results also can be influenced the effect external variables to the dependent variable, 8-week fitness program which used the outdoor activities – Nordic walking.

Conclusion. Nordic walking was a positive motivation and an acceptable form of physical activity in the monitored group of seniors. When evaluating life quality, we found that after an 8-week physical activity intervention in the form of Nordic walking there was significant improvement in most of the survey items of the World Health Organization WHOQOL-OLD.

Prevention of altitude sickness during trekking in high mountain areas

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Aim. This study focuses on measures that can prevent or at least limit the formation and subsequent development of acute forms of mountain sickness (AMS) during mountain hiking (trekking) at an altitude over 3000 meters above sea level. The most common causes of mountain sickness are e.g. rapid movement to these heights without prior acclimatization, dehydration, physical overload, global fatigue, underestimating the first signs of AMS. The study aim is to contribute to further knowledge in the prevention of acute and life-threatening forms of altitude sickness and offer one of the main methods of how to recognize actual states of AMS.

Methods. This case study measured oxygen saturation (SpO2) by pulse oximetry MarcoPOX of 22 people during four campaigns from 1999 to 2007 in the Himalayas - Nepal, Tibet, India, Karakoram - Pakistan. Regular monitoring of SpO2 in the morning and evening, recording and subsequent comparison of data from previous days allowed us to monitor their condition accurately. If there was a noticeable deterioration of SpO2 below 87%, or signs of altitude sickness, such as significant increase in heart rate, headache, strong feeling of fatigue, etc., and these symptoms had not improved by the next day, measures were implemented immediately to ensure the condition was corrected.

Results. The following are the measured values of oxygen saturation in% SpO2, during the event.

— Lowlands: 95-98% SpO2 i.e. values encountered under normal conditions

— Height 3-4000 m asl Average: 92% SpO2, max.: 95% SpO2, min.: 90% SpO2

— Height 4-5000 m asl Average: 88% SpO2, max.: 92% SpO2, min.: 83% SpO2

— Height 5-6200 m asl Average: 86% SpO2, max.: 90% SpO2, min.: 79% SpO2

Participants could be divided into three groups.

— The 1st group (7 people) had no problems with AMS, their saturation was always close the upper limit of the whole group.

— The 2nd group (9 people) had problems with acclimatization, but after few days they disappeared. Their saturation was in the average of the whole group.

— The 3rd group (6 people) had serious problems with AMS and they could not stay in the higher altitude for a longer time, so there was no possibility to get to the top of the peak. Their saturation was close to the lower limit of the whole group.

Conclusion. Measurement of oxygen saturation (SpO2) gave us the possibility to immediately react to the speed of ascent and control other factors that influenced acclimatization.

Comparison of barefoot and shoe running

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Aim. This presented study provides a comparison of muscle activation during barefoot and shoe running.

Methods. Twelve runners were measured during running barefoot and with shoes on smooth asphalt. The runners were experienced athletes training at least 5 days a week. Each runner performed six 20 second long runs (3 times without shoes and 3 times in shoes). The behaviour of the muscles (m. tibialis anterior dx & sin, m. peroneus longus dx & sin, m. gastrocnemius med. & lat. part dx & sin, m. gluteus medius dx & sin, m. tensor fasciale latae dx, m. gluteus maximus dx, m. biceps femoris dx, m. quadriceps femoris dx: vastus medialis, lateralis, rectus femoris) on the lower extremities were assessed with non-invasive technique and methods – surface electromyography by muscles tester ME 6000. The measuring was synchronized with a HD video camera. Triangle-based muscle onset detection was used within all periods of the EMG envelope signal. The average covariance of subsequent EMG envelopes was calculated for every muscle with computer software Megawin and Matlab. The covariance has similar interpretation like the correlation (the repeatability of the muscle activity pattern represented by the EMG envelope), however we assume that it provides more accurate information because of its ability to reject the direct current bias of the EMG envelope signal.

Results. The average covariance of EMG signal among locomotion's cycles during running in full muffled running shoes was higher (0.72 ± 0.14) than from running without shoes (0.68 ± 0.17). The activation of leg muscles was more periodic in shoes than barefoot. This result can be brought out by the comfort in shoes. The current results corresponded to our previous research comparing free bipedal walking in shoes (cov. 0.81 ± 0.10) and without shoes (cov. 0.78 ± 0.12. The main limitation of our study is the small sample of runners. We may expect different results in population with different running technique.

Conclusion. The current results showed more regular EMG signal in leg muscles during running in full muffled shoes than barefoot, which may be associated with more economical locomotion of running.

The research was supported by Asics Company and grant MSM 0021620864.

SESSION 2
ADVENTURE ACTIVITIES AND CHALLENGE SPORTS IN PERSONAL DEVELOPMENT

Enough about the outcomes … what about the process: personal development and adventure sports

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Background. Early research in adventure sports tended to focus on outcomes primarily relying on psychological constructs. This happened for good reason – not least to secure funding but also to understand the benefits that result from such experiences. More recently, there has been an increasing research on process and sociological conceptions of adventure sports. While the latter can provide some theoretical insights the former is needed to inform pedagogy.

Case report. This presentation is focused on both outcomes and processes from two different contexts. The first example details work drawing on self-determination theory which is pragmatic and focuses on the outcomes of wilderness adventure education. The second example concentrates on Sail Training and presents a recently developed model to gain a conceptual understanding with a pedagogical focus. For both examples I will detail the challenges of undertaking the work and the perceived benefits.

Crisis and campfires –The educational potential of adventurous journeys

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Background. Outdoor adventure journeys are often characterized by two basic situations, decision-making and gathering around a campfire.

1. Adventures are chains of critical situations in which the usually working routines break down. Roads and paths are blocked, equipment is damaged or lost, weather conditions change rapidly, injuries happen a.s.o. In order to keep up autonomous acting, decisions have to be made which can have serious consequences.

2. After the day campfires are the place where the group gathers, where the meals are cooked, where the eating takes place and where the activities of the day are retold.

Case report. Both kinds of situations reveal educational potentials:

1. Critical situations give the opportunity to experience various dimensions of decision making,

2. Campfires are the structural place where the processes of community building can be experienced.

The presentation focuses on both dimensions, which make adventures so attractive for both adults and children.

Unforgettable impressions of an adventurous journey: what remains from the last journey on a wild river in a wild landscape?

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Background. A multi-day canoeing trip on a wild river in a wild environment includes activities like canoeing down white water rapids as well as calm passages, portaging canoes and equipment in dangerous situations, setting up camp for the night, making meals and so on. Sitting on the campfire at night or returning back home stories of hard conditions in and on the water, of blockings, waves, wind and rain will be told. This happens in order to digest all experiences of such an adventurous journey.

Case report. In order to have a deeper understanding of unforgettable impressions of students who have done an adventurous journey in the wild landscape in Scandinavia on the master's course at our University we asked some of the participants in an interview for their memories. We were quite surprised that after some weeks their pride in successfully mastering the wild rapids and the cold were no longer the focus. The story of their journey had changed to that of landscape perception and of sunsets. Apparently these impressions have left deeper marks in their mind.

What remains from adventurous journeys? The presentation is based on a case study and discusses some theoretical approaches of vivid memories and of receding memories of adventurous activities.

Effects of mental toughness in outdoor adventure program among Malaysian intervarsity athletes

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Aim. Mental toughness is an important characteristic of high performance athletes. Researchers have argued that outdoor adventure program effects positively on participant's socio-psychological development including mental toughness. In Malaysia, several outdoor adventure programs were conducted by the National Sport Council (NSC) with the purpose to improve youth athletes' mental toughness. Several universities also conducted similar programs to enhance their athletes' performance. However, few studies have been conducted to clarify the effectiveness of such programs. The purpose of this current study is (1) to examine the effects of a university outdoor adventure program related to participants' mental toughness; (2) to investigate gender influence and (3.) to identify outdoor activities that specifically affect participant mental toughness.

Methods. The 42 items of the Psychological Performance Inventory (PPI; Loehr, 1986) were used as the study instrumentation plus a participants' demographic questionnaire. Respondents were 265 (n = 165, experimental group; n = 100, control group) Diploma in Sport Studies students, aged 17-30 years old. The data was collected during their five day outdoor adventure camp.

Results. The primary findings of this study support the notion that this outdoor adventure program is effective in enhancing respondents' mental toughness. Gender did not play any significant influence on the improvement of mental toughness. The students rated survival activities as the most influential towards their mental toughness improvement.

Conclusion. This study concludes that this outdoor adventure program is effective in enhancing mental toughness among young athletes.

The ways of coping with risk situations and potential benefits of these experiences for personal development of the challenge sport`s participants

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Aim. In the context of recent trends in the personality research, individuals who cope with difficult and risk situation are systematically monitored. Our research in the area of chosen challenge sports where the participants are regularly confronted with increased objective risk corresponds with these directions. In such a case we can think of unusual situations as the challenge for findings of individuals coping strategies, mechanisms of mobilization of sources and reserves and processes of informal learning from own mistakes and new experiences. The aim of our study is to indicate the ways of coping with risk situations and determine potential benefits of these experiences for personal development of the challenge sport`s participants.

Methods. Our research sample was composed of male (15) and female (5) riders ranging in age between 17 and 30 who compete or lecture in freeskiing and freestyle snowboarding. Data was collected through three semi structured interview-based focus groups, three individual interviews, and through participant observation. The research has been realized in the winter season 2011 in Czech and Slovak Republic. The qualitative data analysis software ATLAS.ti 5.0 was used as a platform for the clustering-based analysis.

Results. The findings show several more or less unconscious defensive mechanisms (e.g. risk appraisal, depreciation and avoidance) and specific coping strategies (such a distraction, visualization, stimulation, concentration, talismans and media) that participants use to manage the risk situations. Social support with a deep respect of personality uniqueness that the individual derives from the community environment of freeskiing and freestyle snowboarding emerged as one of the major resources for coping with risk. Sharing the freedom of edgework experiences with companions offers opportunities for self actualization. We are apprehensive of limitations of our study and we won't apply the results to the whole group of challenge sports.

Conclusion. Our study controverts the common stereotypes of individuals involved in challenge sports such a freeskiing and freestyle snowboarding as a people bald-headedly taking risk. By contrast the participants choose steady improvement, taking step by step to the point when after long training they can allow a riskier jump. The participants consider their own limits and if they assess the situation as dangerous they often avoid it. The community background creates a space for mutual support among the riders, in which they often collectively master the elements in the snowpark, overcome the fear, advise and learn from each other and motivate themselves to better achievement. The athletes' benefits from the shared edgework experiences include increased confidence, self-esteem and ability to realistically assess personal limits and potentials. We suggest extending the focus of future research of personal development through challenge sports participation to observation of structure and development of the social group.

Spiritual aspects of the experiential education course "Život je gotickej pes 2011"

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Aim. Despite the fact that the theme of spirituality is rather rare among Czech experiential education literature, there is a huge potential to explore this human dimension in such courses. The objective of this study is to outline the connection between spiritual dimension and an experiential education course, Život je gotickej pes 2011, organized by Vacation School Lipnice. Spirituality is a concept which can somehow be understood, and whose intricate system of understandings and connections can be perceived and experienced, but cannot be provided with a strict definition. We focus on spiritual aspects found among both instructors and participants of the course. The instructor's point of view is represented by the aims and themes of the course that were transformed into the course dramaturgy. The point of view of the participants is represented by actual experiences revealed in their feedback essays from the course.

Methods. To fulfill rather descriptive aims of the study we used a set of qualitative research methods. A review of literature gave us theoretical insight into the field of spirituality, the Czech way of experiential education and a method of course design called dramaturgy. Content analysis of the feedback essays written by the participants revealed possible spiritual aspects linked to the course dramaturgy. We also used a method of participative observation to get a complex view of the course as both authors were involved in the course, one as a participants and the other as an instructor.

Results. Some common spiritual aspects were found in the course dramaturgy as well as in experiences of participants. At first the whole perception of a winter pilgrimage led towards seeking meaning in life through transcendence of daily experience. The focus on basic and important aspects of life as well as surrender to a higher power represented by winter nature stressed spiritual aspects. The challenge of the winter pilgrimage evoked the focus on the present and experiences of now and here. The question left is, to what extent are the spiritual aspects mentioned above, caused by the dramaturgy of the course, by setting the course in winter conditions or by the general openness of the participants and instructors to spiritual dimensions of reality.

Conclusion. The study outlined the possibility of understanding spiritual aspects of reality within experiential education courses. It is one of the first studies of its kind in the field of Czech way of experiential education. Though both central themes of the study, spirituality and experience, are perceived on highly individual level, it is difficult to come up with strict results. On the other hand this creates a space for further and deeper inquiry in the field of spirituality in experiential education.

Motivation for climbing and its continuity in time

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Aim. Motivation in climbing is a topic that has been addressed several times. The authors dealing with this topic emphasize a close relationship with nature (Vause, 2000), desire to belong to a specific group of people (Ewert, 1994), physical satisfaction in the context of nature

(O´Conell, 1997), risk searching (Breivik, 1999) and "flow" (Csikszentmihalyi, 1997). This study focuses on clarifying the motives for starting climbing activities, the motives for transition from climbing and the motives for the present mountaineering activities.

Methods. In this study the method of analyzing interviews with a narrative content-categorical analysis was used. The authors used semi-open funnel-type interviews, which were decoded and interpreted after transcription. Lieblich, Tuvalu-Mashiach and Zilber (1998) noted that the categorical content approach enables researchers to determine content categories, identify the subject, organize units of analysis into categories and deduce conclusions from the results. The actual content analysis emphasizes repeated words/phrases which are then grouped into pre-defined categories or into categories created in the course of analysis. The motivation was observed in three periods: the first motive for sport climbing, the first motive for mountaineering and the current motive for mountaineering. Individual motives were divided into several major categories: nature/environment, overcoming ourselves, performance, new experience, social needs, internal "mysterious" power, enjoyment, sport/exercise and adventure. The second part of the analysis was led in a more theoretical way: the authors tried to find sentences which would support the theory that the climbers reached the mental state of 'flow'. After a rigorous analysis of each interview, all data were compared. The comparison presents elements in motivation that are common for all climbers, as well as elements which are specific only for a small group or individuals. The interviews were carried out with eight climbers with different performance levels: from a climber who climbed level VII according to UIAA grading system to a climber who climbed 13 eight-thousand peaks.

Results. An important role in both climbing and mountaineering is played by the environment - the nature seems to pull the climbers to itself with a mysterious force. The motives differ for each climber according to his actual climbing career and his individual personal development. The most common motives for climbing are the nature, the community of climbers, a close person and/or self-fulfillment (in various areas, like the achievement of our objectives, overcoming ourselves and increasing our performance). Less common motives are the need for education, the need for knowledge, the need for travelling, the need for experience, the need for adventure and the need for relaxation. The predominating motives for starting to climb mountains are the mountains themselves and the urge to explore them. For climbers with higher performance, who prefer to climb the highest peaks, the prevalent motive is overcoming self. For the climbers with no experience of climbing the social group is important.

Conclusion. The first motivation for climbing is the community of climbers (Ewert, 1994), which was confirmed in this study. The study has also shown that the more experienced, both good and bad, the more powerful is the motivation for climbing. Thanks to their rising experience, most climbers are more aware of the imminent risks and they can predict them to the maximum extent possible, as was already shown in the Breivik study (1999). All climbers testified that overcoming themselves plays an important role in their motivation.

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Group reflection in lecturers of personal and social development

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Aim. Field of personal and social development as a significant space to apply a concept of "outdoor education" is, in long term perspective, dealing with a not very clear, unambiguous, and outspoken definition and theoretical basis, does not attract attention of substantive numbers of empirical study authors nor does it by far find its place in the focus of a pedagogical "mainstream". Given a bit of exaggeration, we may assert that we actually do not even know much about personal and social development. In the presented paper, we inform expert public about results of a conducted research, in which we try to reveal a way of practical grasp of one of the most significant parts of the programs of personal and social development, and that is a group reflective session. We are interested in the goals pursued by lecturers at the group reflective sessions, through what particular actions are these goals being fulfilled and in what common communication structures are these actions taking place.

Methods. Declared goal is being achieved by means of a qualitative analysis of eleven video-studies of group reflective sessions, series of in-depth interviews with chosen lecturers of personal and social development and stimulated observation of their work. That is in some cases supplemented also by data of quantitative nature, which are used as a support picturing the final image of a crystalized interpretation framework. We assume that even these may, in certain moments, present efficient supplement of a compiled "mosaic", and be thus significantly helpful in a complex understanding of observed events. Chosen design might therefore be specified as mixed.

Results. One of the essential outcomes of the research is defining of a basic model of leading group reflective sessions, in which all of the emerging categories are being demonstrated – goals pursued by lecturers (endeavor to secure a material for learning, the learning support itself and setting and eventual optimization of learning conditions) and a group of static (personality factors, professional background) and dynamic variables (topic and goal of a particular group, factors on the part of participants etc.), which influence a communication style of a lecturer, throughout which the aforementioned goals are being achieved. In the following text, particular actions of lecturers which are being used to fulfill these goals, in an original style, are then gradually analyzed. These are in conclusion set into a stable communication structure of the group reflective sessions, which brings information as to in what common organizational structures and using what communication exchanges are the three identified goals being achieved.

Conclusion. Paper contributes to an understanding of one of the most significant and hitherto not much revealed parts of programs of personal and social development (namely outdoor education programs), through which exploitation and valuation of gained experience and practice is being made via pedagogic research optics. It shows that, in spite of a relatively significant diversity in approaches of particular lecturers, group reflective sessions have its vigorous rules and regularities and it is possible to, rather easily, anticipate its course. Likewise, significance of certain factors influencing the quality of a work of a lecturer (e.g. more than a professional background or a real experience level, involvement of lecturers in one of the forms of reflections of their own practice proves to be important) is being unveiled.

SESSION 3
PERFORMANCE IN OUTDOOR SPORTS

Injury prevention in marathon runners

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Aim. The study investigated the factors that may predispose marathon runners to injury. These will be; number of marathons completed in the past, time taken to complete marathon, previous history of injury, following a marathon training plan, experience of pain whilst running during training, age, sex and number of training runs per week. Each factor was compared with injury sustained whilst running the London Marathon where injury is defined as any time during the run that an individual needed to stop. This did not include toilet breaks.

Methods. Survey Monkey, an online survey website, was used to generate two questionnaires which then produced a unique link which was sent out to all 89 runners via email. , the first 12 days before the London Marathon, which occurred on Sunday 22nd April 2012 and the second 16 days after. The first questionnaire asked for demographic information, previous history of running injury, number of marathons completed in the past and training habits whilst the second inquired about problems whilst running the marathon and recovery time to normal functionality. Two follow up emails were sent and individuals were then telephoned. All individuals were given the opportunity to opt out of the survey. The mean response rate across both surveys was 62%, greater slightly in males than females (62.5% and 57.5% respectively).

Results. There was a significant relationship found between time and injury whilst running the London Marathon ($p = 0.003$). This was supported by the fewest percentage of runners who sustained an injury were those who ran the marathon in less than 4 hours (13%). No associations were found between previous history of injury ($p = 0.947$), first time marathon runners ($p = 0.688$), following a training plan ($p = 0.601$), pain whilst training ($p = 0.204$), age (0.376), gender ($p = 0.138$) and number of training sessions per week ($p = 0.770$) and injury incurred on the day of the London Marathon. In this study the average age of male runners was 40 and females 42. 61% of runners had sustained an injury whilst training for a marathon and the knee was the most common site (36%). Training plans were followed by 68% of runners and the mode number of training runs per week was 4. Runners commonly stated that they regularly suffered from pain whilst running (57%) and of that total 84% took anti-inflammatories, paracetamol or both. It was also found that 45% of runners were participating in a marathon for the first time and the average marathon time was 4 hours and 36 minutes. In addition evidence found in this study would suggest that most runners were able to return to running shortly after the marathon demonstrating that the acute after effects on physical health are minimal. The mean time that runners took to feel ache or pain free was three days, and most returned to running in a week. This suggests that injuries sustained by most runners during a marathon are not serious enough to cause significant long-term complications.

Conclusion. This study indicates how difficult it is to determine who will sustain an injury whilst running a marathon. A relationship is shown between marathon time and injury sustained during the run. The findings highlight that they are many risk factors for incurring injury but few proven by scientific research. There is a need for guidelines for all marathon runners to help reduce rates of injury.

Muscle activity in adults and children using via ferrata carabiners

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Aim. Compared to customary carabiners self-locking via ferrata carabiners are higher dimensioned in size and failure loads. Via ferrata climbing has become increasingly popular by families with children, but currently there is no specific equipment available for child use. Therefore, the applicableness of a new effort saving via ferrata carabiner has been evaluated.

Methods. Twelve adults (21 to 29 years) and twelve children and youths (7 to 15 years) tested a new effort saving via ferrata carabiner ERGOTEC (Salewa) and two conventional carabiners - OneTouch (Ederid) and ATTAC (Salewa). The activities produced by the flexors M. brachioradialis and M. flexor carpi ulnaris were measured in two loading situations by using Electromyography (EMG, Noraxon MyoResearch XP Master Edition). Each test person performed

1. a periodic loading, in which the test person sat on a chair with their elbow on the table and pressed the carabiners while a metronome set the pace. The mean muscle activity of five representative maximum values was evaluated.
2. a realistic practice at a climbing wall, in which the mean muscle activity of three runs with four compressions of the carabiners each was evaluated.

The overall mean values of the muscle activities were calculated both test groups. The effect of the new effort saving carabiner was evaluated by a comparison of the measured muscle activities with the two conventional carabiners.

Results. Normalized on the muscle activity measured with the conventional carabiner OneTouch the mean value of all adult test persons decreased -49 % for the M. brachioradialis and -52 % for the M. flexor carpi ulnaris by using the new effort saving via ferrata carabiner during the periodic loading. The overall decreases measured for the twelve children and youths were less with -35 % for M. brachioradialis and -34 % for M. flexor carpi ulnaris. During the simulated realistic practice at a climbing wall the decrease for the adult test group was -19 % for M. brachioradialis and -22 % for M. flexor carpi ulnaris and for the children and youths -20 % for M. brachioradialis and -17 % for M. flexor carpi ulnaris. Normalized on the muscle activity measured with the conventional carabiner Attac the decreases with the new carabiner were evaluated as follows: During the periodic loading a decrease of -23 % for the M. brachioradialis

and -7 % for the M. flexor carpi ulnaris for the adult test group and -33 % for the M. brachioradialis and -22 % for the M. flexor carpi ulnaris for the child and youth test group. During the simulated realistic practice a change of +2 % for the M. brachioradialis and -26 % for the M. flexor carpi ulnaris for the adult test group and -27 % for the M. brachioradialis and -23 % for the M. flexor carpi ulnaris for the child and youth test group.

Conclusion. With the use of the new effort saving via ferrata carabiner a reduction of the muscle activity compared to two conventional carabiners was observed for the adults as well as for the children and youths. For a final evaluation the handling of the carabiners for child use with the individual anthropometry has to be considered.

Contrasting effect of submaximal exercise on circulating serum VEGF under different oxygen status

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Aim. Vascular endothelial growth factor (VEGF) is an important mediator of hypoxia induced angiogenesis that upregulated by hypoxia in vitro. But, in vivo data about VEGF regulation in hypoxic condition are conflicting. Discrepancy in results is probably based on differences in intensity of hypoxia during the studies. So, the present study investigated the effect of a single bout of exercise on the serum VEGF under different oxygen status.

Methods. 10 healthy men participated in this study (25.4±2.8 yr & BMI= 22±2.8 Kg/m2). Each subject, after the determining of VO2 max under normoxia 21% O2, hypoxic 16% O2, hypoxic 15% O2, and hypoxic 14% O2, completed four cycle training sessions under normoxia 21% O2 (sea level), normobaric hypoxia 16% O2 (corresponding to an altitude of 2300 m), normobaric hypoxia 15% O2 (corresponding to an altitude of 2700 m) and normobaric hypoxia 14% O2 (corresponding to an altitude of 3300 m) conditions. All subjects performed and completed a 1-h cycle ergometer exercise bout at 50% of VO2 max and also rested in the sitting position under normoxia 21% O2 hypoxia 16%, 15% and 14% O2 air for 2 hours. Three blood samples (Pre exercise, immediately post and 2 hours post exercise) were collected from an antecubital vein from each subject at each training session. Serum VEGF was measured by ELISA method.

Results. Results of the study showed that acute exercise increased serum VEGF under hypoxia 14% O2, and unchanged in hypoxia 15%O2 and 16%O2, but serum VEGF decreased under normoxia condition in response to submaximal exercise at immediately post exercise($p=0.0001$). Furthermore serum VEGF at 2hrs post exercise in comparison immediately post exercise increase significantly in hypoxia 15%O2 , 16%O2 and normoxia ($p\leq0.05$) but at hypoxia 14% O2 decrease 32% ($P=0.79$). Also, arterial oxygen saturation (SaO2) decrease significantly in response to exercise under different oxygen status ($p\leq0.02$).

Conclusion. Our study demonstrates for the first time that different oxygen status have a different affect on circulating serum VEGF in response to submaximal exercise in vivo. These results may provide a way of understanding the mechanisms of VEGF regulation in humans and may be of interest with respect to the altitude training used by competitive athletes to improve their sea-level performance.

Ankle isokinetic strength and postural stability in slackliners

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Aim. The aim of the study was to assess the ankle strength during plantar and dorsal flexion and the postural stability in slackliners.

Methods. The research sample consisted of two groups (slackliners and a control group). There was 1 woman and 8 men (mean age 25.0 ± 0.9 years, body weight 74.6 ± 6.6 kg, and body height 180.8 ± 6.4 cm) in the slackline group. The control group consisted of active participants with no experience with the slackline. The participants were matched by age, gender, body weight and body height (1 woman and 8 men in the age of 22.9 ± 0.8 years, body weight 73.3 ± 8, 9 kg, and body height 181.0 ± 8.0 cm). Ankle strength was measured by isokinetic dynamometer (Humac NORM ®, CA, USA). Ankle strength was assessed for plantar and dorsal flexion in a lying position with 90° at the knee joint. The protocol consisted of two angular velocities (30°·s-1 and 120°·s-1) with 5 and 15 repetitions for plantar and dorsal flexion. Ankle strength was assessed by peak torque (PT), which was related to body weight. The time to peak torque (TP) was chosen as a time parameter. The postural stability was evaluated by one leg stand with opened eyes for 63 s on a pressure platform (FootScan ®, Belgium). Total trajectory way of centre of pressure was considered as an indicator of postural stability. Differences between groups were assessed by one-way ANOVA. The alfa value was set to $p<0.05$ and $\eta p2$ coefficient was computed to express the explained variance by the independent variable.

Results. The results showed significantly higher relative ankle strength during plantar flexion (at angular velocity 30°·s-1) in the slackline group than in control group (left: 1.51 ± 0.31 vs. 1.20 ± 0.30 N·m·kg-1. $p<0.05$. $\eta2=0.21$; right: 1.55 ± 0.34 vs. 1.21 ± 0.34 N·m·kg-1. $p<0.05$. $\eta2=0.22$). There were no significant differences between groups in other variables tested (postural stability, ankle strength in angular velocity 120°·s-1, time to peak). The limitation of the study is a small sample size and the conclusions should be verified by an experimental design of the study.

Conclusion. The slackliners are characterized by significantly greater ankle strength in the plantar flexion than the control group with physically active students. The results indicate that the activity on the slackline may be considered in the prevention of ankle injuries and rehabilitation programs.

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What speed and slope inclination should be chosen during ski-mountaineering?

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Aim. Ski-mountaineering contains elements from alpine and cross-country skiing. Increasing numbers of ski-mountaineers around the world has been documented, but research in this area remains still limited. The goal of the present study is to assess the effect of speed and the slope inclination on energy expenditure during ski-mountaineering.

Methods. Twelve athletes (mean age 30 ± 8 years) took part in the study. This was a random intragroup experiment. The energy

expenditure was determined by spiroergometry based on the ratio of O2 and CO2 exhaled. The anthropometric values and individual ventilation parameters were measured following a warm up. The study was undertaken on the treadmill (Saturn HP Cosmos, Germany) allowing walking with specially adapted roller skis and poles modified for ski-mountaineering. The test was initiated by a warm-up lasting for 4 minutes at a speed of 3.5 km·h-1 and 16% slope. The next measurements consisted of 4 parts: walking at 24% gradient and speed 3.5 km·h-1, 20% gradient and speed 4.2 km·h-1, 16% gradient and speed 5.1 km·h-1 and 12% slope with a speed 6.8 km·h-1. The load lasted for 8 minutes 30 seconds in order to achieve the elevation 200 m. Passive recovery for 20 minutes was administered between each measurement. The air temperature during measurements was 20 ± 1 ° C.

Results. The average energy expenditure at 24% slope was 273.4 ± 57.1 kJ, at a 20% slope 280.8 ± 7.7 kJ, at a 16% slope 300.1 ± 62.3 kJ and at a 12% slope 324.8 ± 44.3 kJ. The results showed the lowest energy expenditure at 24% gradient and speed 3.5 km h-1. Four participants could not complete the test at a 12% slope, generally from a poorly managed technique.

Conclusion. Ski walking on a treadmill at a speed of 6.8 km h-1 requires a high mental concentration. The lowest energy expenditure was shown during the walking on skis in steepest slope and lowest speed of locomotion.

Analysis of performance in simulated cross country skiing sprint racing by using skating technique on roller skis by junior skiers

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Aim. The present study analyses the main factors determining the performance of junior cross country (XC) skiers in simulated sprint races on roller skis. It also addresses the hypothesis of whether performance in simulated freestyle sprint races and the time spent in each section of the racetrack have close relation to a maximum muscle performance test on ski simulator.

Methods. Eight Czech male junior XC skiers performed a simulated freestyle sprint race (4x1600 metres with 20 minutes rest) on the racetrack of the World Championship in Liberec – Vesec. We looked into their performance in simulated freestyle sprint race and the performance in each section of the racetrack. We measured the total time and the time measured in five different sections of the racetrack. The total time, time and speed measured in different sections were taken by using sport tester Polar RS800CX with GPS navigation and Google Earth. In addition, the athletes underwent the laboratory test of spiroergometry on the treadmill and maximum power performance test on Skierg. The test on the treadmill was performed with increasing load until athletes' exhaustion and during this we measured the maximal aerobic capacity (VO2max), blood lactate concentrations (LA) and maximum heart rate (HRmax). Using the ski simulator -Skierg we investigated the maximal power performance and blood lactate concentrations.

Results. We discovered that the final time in the simulated race correlates with two measured sections in the ascent and one measured section in flat terrain (ruphill1= 0,92; rflat= 0,79; ruphill2= 0,70, p≤0,05). A correlation has been shown in dependence of measured section of downhill and total time (r= 0,55, p≤0,05) and between both measured sections in the ascent (r= 0,62, p≤0,05). Correlation has also been found between the maximal aerobic capacity VO2 and final time in simulated race (r= -0,80, p≤0,05). When we were analysing a connection among the performance in simulated freestyle sprint race, time spent in each sections of the racetrack and results from maximum power performance test on Skierg we found a correlation between results from the maximum power performance test and the final race time (r= - 0,61, p≤0,05) and correlation has been also established between results from the maximum power performance test and the time of the first and the second measured sections in the ascent (ruphill1= -0,69; ruphill2= -0,73, p≤0,05). On the contrary a low dependence has been detected between the time in flat terrain and results from the maximum power performance test (r= - 0,25, p≤0,05).

Conclusion. The results show that the time spent in the ascent, in the flat terrain and especially during the second part of the racetrack correlate with total output in the race. It means that the crucial factor of performance is an ability to keep the average speed for the entire length of the race. Other important factors of skiers' performance are physiological conditions which are correlated both the final time at the finish line and measured sections in the ascent. At the same time we discovered that the strength abilities of athletes are participating for the total output of the run on roller skis. It follows that modern cross country skiing is increasing demands on strength-endurance capability for classical technique cross country skiing and skating.

SESSION 4
ENVIRONMENTAL ASPECTS OF OUTDOOR ACTIVITIES

Sustainable consumption patterns in outdoor sports

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Background. 40 years after the publication of the Limits of Growth (Meadows, Meadows, Randers & Behrens, 1972) the political and social mainstream still believes that economic growth is an adequate answer to the challenge of the 21st. century: the depletion of natural capital and resource consumption above the regenerative capacity of the earth. This is a fatal mistake, or to cite Meadows: "If you do something and it causes problems, doing it harder, or faster, generally won't solve those problems." In combination with demographic dynamics, poor governance, geopolitical imbalances and shifts in power, unsustainable resource consumption leads to climate change, water scarcity and evident escalations like local wars, trade conflicts and streams of refuges; issues you can find in the front pages of the newspapers every day.

Today there is strong evidence that there are physical limits to the planet (Meadows, Randers & Meadows, 2004; Wackernagel & Beyers, 2010). Furthermore, there is evidence that natural resources cannot be completely substituted by other forms of capital (e.g. social or human). Those understandings led to the concepts of 'strong' or 'critical sustainability (Ott & DÖring 2004). So, what is the consequence? Let's drink champagne as we can't stop the Titanic from ramming the iceberg? Maybe this is a tempting position for some but deeply immoral. Logically consistent is the need for "changing consumption patterns" directed towards the developed countries and the lifestyle of the majority their societies.

Case report. Sport is definitely an important part of the culture and lifestyle of western societies. The German Olympic Sports Federation (DOSB, 2006) indicated that sports related consumption was 20 billion Euros and the total sales of the German sports industry 15 billion Euros. German sports clubs have 27 million members. Sport is an important social and economic factor. So it is more than adequate to ask, what do "sustainable consumption patterns" mean in connection with the sport sector and more specifically outdoor sports? Is it about bird protection in kayaking or leaving no chalk traces in rock climbing? Can we apply the concept of ecological footprint to outdoor activities? What programs do exists to promote sustainable outdoor sports? What is the right scale for actions? What actions have been taken so far? Are some outdoor sport more sustainable then others? The presentation seeks answers to these questions primarily based on German examples but also includes a broader European perspective.

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How does the changing climate affect our activities in the outdoors? (And vice versa)

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Background. Being active outdoor sport players and trainers we need nature not only for our passion, but also for practicing our profession as teachers, trainers or mountain-guides. Although we manage to find substitutes for nature, by constructing high-rope-courses, indoor climbing halls and even artificial (canoe) rivers, the real thing will always only be found outside, in nature. Always? Will our beloved playground still be available/accessible next decennium or for the next generation?

Case Report. The climate is changing and at a quickening tempo, glaciers are shrinking, there is increased ferocity of (summer) storms, mountain slopes are crumbling as a result of the retreat of the permafrost. The question is no longer does it change? But how fast does this change go and what will happen next? For us, 'users' of nature, the questions are even more concrete: how does this climate-change (and thus 'landscape & weather-change') affect our activities? Will we be able to continue practicing our activities where we have been practicing them over the last decennia? How can we adapt to the changing circumstances?

When it comes to mountaineering (hiking, canoe, climbing, alpinism) those questions are even more acute.More than anywhere these changes are visible (and tangible) in (high) mountain regions. Questions about security and risk management are growing: How long will it still be possible to cross glaciers? Are those slopes still safe to walk on? When will the next rock face tumble down? Can we keep on belaying our shelters on the ever more instable getting soil? Is adaption at all possible?

Hencewe should also think about how we (can) influence this evolution: How does our behavior affect these changes? How can we reduce our impact? International Friends of Nature are active in this field of growing awareness of these problems, searching for ways to motivate outdoor sport participants to adapt their behavior. Not only for their safety (mountain-sports are more hazardous than ever), but for the sustainability of our beloved activities and nature as such.

Outdoor activities and the natural environment: a resilience metaphor bridging the human-natural interface

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Background. Sport is perceived from different viewpoints: as a source of harmony that contributes to a balance between the mental and physical elements of a human being, or as a continuous attempt to surpass the physical limits posed by the body – the philosophy greatly depends on whether instrumentally rational thinking is applied or whether it is more intrinsic. In the context of a more performance oriented approach that stresses a continu-

ous increase in human capacities some "limits to growth" of individual performance could be defined that should not be exceeded without risk to human health. On the other hand, these limits are constantly shifting due to a growing pool of experience and technical knowledge in the sports field. The aim of developing this know-how is to maintain a certain resilience without overreaching the body's limits.

Case report. As the term resilience is related to systems thinking and is defined as the "capacity of a system to maintain and renew itself particularly in the presence of stressors", it acquires similar meaning in the field of medicine, psychology, ecology or the social and cultural sciences, and it could be used as a metaphor that enables the interrelation of these fields and the bridging of the gap in their practical applications. As a metaphor it can also contribute to reducing the tension between phenomenological (stressing experience and intrinsic benefits) and technical (oriented toward outcomes and its technical support) understanding of sports activities: based on the resilience concept, a better reflection of physical load and its proper management to enhance the positive experience of training is possible

The relationship between human beings and the environment is a constitutive element of outdoor activities and might have an enormous psycho-social impact (psycho-evolutionary theory in particular expounds a reconnection of modern societies with natural ways of living). The environmental dimension is an important aspect of outdoor education, but it has recently been neglected as its key elements are considered to be "activity, self and group" (Nicol, 2002). Due to external forces (e.g. financial stringency and need to prove cost-effectiveness), the spiritual factor has been left out which has had a twofold impact: the changing nature of outdoor activities and environmental degradation as a result of this modified character. The latter aspect reveals the role of environmental sensitivity that is embedded in the sporting activities of this kind and which has some educational relevance.

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Orienteering and environmental protection in the Czech Republic

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Background. Orienteering is a relatively popular sport in the Czech Republic with more than 7,000 registered competitors. Some ecologists have stated that orienteering, thanks to its off-track nature and the large numbers of competitors, has the potential to damage flora and fauna. In practice, of the many thousands of orienteering events that are held worldwide each year, ecological incidents resulting in unacceptable damage are extremely rare - in fact, close to zero. Unlike some other sports pursued in natural surroundings, orienteering does not require any long-term modifications to the natural landscape, no special devices, and no buildings. On the other hand, this sport has also important social dimensions as all age groups are catered forwith (almost) equal importance.

Case report. Organizers of orienteering events in the Czech Republic have different attitudes regarding state administration in different regions and protected areas. What are they doing for nature protection and what are they able to improve further? We introduce the concept of gradualization used in nature protection debates in the Netherlands (Keulartz, 2009) into the Czech context. We also discuss within the article the possible methodology of predictable cooperation with state administration on the basis of EU Natura 2000 maps of biotopes.

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Exposure of children to atmospheric aerosol in school gyms

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Aim. Research into the indoor environment has shown that schools are buildings with high-levels of Particulate Matter (PM) concentrations. This is especially in the case of schools situated in high-density traffic or in industrial areas. Several studies have also indicated the impact of PM on the teenage generation's health. So far no detailed study has been performed to cover the environment of school gyms where the PM dynamics are different from other indoor microenvironments. This different dynamic relates to the gym environment heterogeneity and to the human activities taking place in it. Due to higher pulmonary ventilation, the exposure of the exercising pupils can reach levels possibly noxious to their health.

Methods. Size resolved mass concentrations of aerosol were measured in three elementary schools in Prague. One school was situated in the city centre with high traffic density. The second school was situated on a plateau on the periphery with a medium level traffic. The third school can be found in Prague south-western suburbia, in an open landscape, with low traffic density. PM concentrations were measured simultaneously in naturally ventilated gyms and outdoors adjacent to the particular school building. Two pairs of monitors were used throughout the study: A DustTrak Aerosol Monitor and a Personal Cascade Impactor Sampler. In total, twenty monitoring campaigns, each 7-11 days long, were carried out at the three schools from 2005 to 2009. The total duration of the measurements amounts to 177 days. In two schools (central and suburban) the coarse particulate matter (PM10-2.5 μm) deposited on the impaction plates of the photometers was also analyzed via Scanning electron microscopy and Energy Dispersive X-ray Spectrometry. During one campaign carried out simultaneously in the central and peripheral schools, the pupils' heart rates were measured during physical education classes. Prior to this measurements a panel of 32 pupils grades 5-8 (aged 10-15) took part in a laboratory stress examination to obtain detailed information about their relationship between the pulmonary ventilation and heart rate characteristics.

Results. The PM indoor concentrations in the gym exceeded limits recommended by World Health Organization. The average 24hour PM2.5 μm indoor concentration did not differ significantly from the data outdoor values with the correlation coefficient reaching 0.91. When comparing indoor and outdoor aerosol level, the correlation coefficient increased with decreasing aerodynamic diameter of the aerosol monitored ($r = 0.32$ to 0.87). This indicates a higher infiltration of fine and quasi-ultrafine particles in the indoor environment. Coarse fraction (PM2.5 μm

- PM10 μm) was related to the number of exercising pupils (r = 0.77). The results show that human activity is its main source. In comparison to outside values, the indoor concentration of coarse aerosol increased several times during physical education days. Scanning electron microscopy showed that apart from numerous inorganic particles, the aerosol is composed mainly from organic residues such as various types of fibres and fungi, mite debris and most of all skin scales, which are the major part of organic aerosol in gyms. Based on the laboratory tests results the estimated ratio between the pulmonary ventilation during exercise and rest was 3.8 (max. = 5.4; min. = 2.7; standard deviation 0.72) showing that physical exercise may cause a 4-fold increase in exposure to inhaled aerosol.

Conclusion. We can conclude that school gyms are indoor microenvironments with high concentration of (mostly coarse) aerosol particles and that exercise may result in exposure exceeding several times the recommended hygienic limits. Cleanliness, type and volume of the physical activity during physical education classes, health conditions of pupils as well as the sources of pollution outside schools are important factors which should be taken into account in education planning. Quality of life is subject to health which is closely associated with regular and adequate physical activity in a healthy environment. Our study focused primarily on aerosols in school gymnasiums. The results have shown that the conditions in these, especially during the heating period of the year, are above the limits for health protection. The same is probably true for most school gyms in Prague and the Czech Republic. More monitored outdoor air has often better quality than the one in the gym when measured simultaneously.

SESSION 5
MANAGEMENT OF OUTDOOR ACTIVITIES

The management of outdoor activities

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Background. Outdoor activities take place in three main mediums, air, land and water, and within these mediums, in a variety of environments. This is distinctly different from many other sports where the activity takes place on a pitch or in an arena. The environment in which outdoor activities take place is often not under the ownership of the participant and may have a different primary purpose such as agriculture and forestry, aquaculture and fishing or even water supply. Outdoor adventure sports are often viewed by both the public and authorities as having high risks – both to participants and other parties and whilst this risk brings distinct benefits it also requires effective management. Despite this there has been an increasing awareness of the economic benefits that such activities can bring from tourism as well as the significant health benefits that there are for participants.

Case report. The management of outdoor activities in any region therefore requires a multi-disciplinary and multi-faceted approach and through this paper the approaches used and issues faced in Northern Ireland to manage outdoor activities, their impact on the environment and their benefits to the economy and health will be highlighted. In 1998 a new Countryside Recreation Strategy for Northern Ireland was produced through a partnership between two Government Agencies. The strategy recommended the creation of a new organisation to bring together all the key stakeholders involved in outdoor activity, including local authorities, land managers and the users. This organisation became the "Countryside Access and Activities Network" (CAAN). From 1998 to 2008 CAAN was focused on developing and improving infrastructure through the development of trails and facilities, carrying out research on key aspects of participation and providing information and guidance for the promotion and management of these activities. Through the implementation of the strategy and general recreation trends, Northern Ireland has seen a very significant growth in outdoor adventure sports participation. CAAN, in partnership with a range of government agencies, have worked to minimise the impact of this growth on the natural environment and to develop increased economic and health benefits to local communities. In 2008 the strategy was reviewed and in 2010 the process of developing a new strategy for the development, management and promotion of outdoor recreation in Northern Ireland was started. The new plan, which will commence in 2013, focuses on 7 key areas:

1. New local, national and strategic forums to provide clear communication and sharing of issues and good practice.
2. The development of appropriate legislation and policies at national and local level to facilitate the growth and importance of outdoor sport and recreation.
3. The provision of and information about relevant funding opportunities.
4. The development of mechanisms to communicate and market the opportunities for participation but also the importance of responsible use and safety.
5. Improving the accessibility of outdoor sports.
6. Promoting the importance of volunteering
7. Research and monitoring so that there is evidence based approaches to development.

Over the past 15 years, the recurring importance of partnership working across a range of agencies has proved to be crucial for effective management. Effective partnerships require time and resources and so the management of outdoor activities is a process that is usually developed in the longer rather than shorter term.

The ethos of climbing in Norway. To compete or not to compete: that is the question!

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Background. This paper will focus on the notion of competition in Norwegian mountaineering and climbing as outdoor sport (friluftsliv). Competition, in Norway, is a crucial element in the distinction between (outdoor) sport and friluftsliv. These tensions originate from questions the pioneers of mountain climbing were facing. Questions that in the special Norwegian context, were linked to important moral and political issues of the time. In 1911 the Norwegian climbers' club Norsk Tindeklub received an inquiry from the organizers of the 1912 Stockholm Olympics. They wanted the club to suggest gold medal recipients in the field of Mountain Sports. After some debate among the members (and double-checking with the British Alpine Club), the club declined the task. They stressed the opinion, that Mountain Sports is a sports field not fitting for competition; that this noble sport is more physically and morally educating (bildung) than any other sport, because it neglects competition and only applies to the better instincts in us. Meanwhile, many of the club-members held a strong desire to prove to their fellow countrymen and the international fellowship of Mountain Sport, that Norwegian climbing held a high standard that they could perform at the level of the very best. This was especially important when it came to the comparison of themselves with many English climbers who visited Norway during the period. The English started climbing Norwegian mountains thirty years earlier than the countries own inhabitants; an 'embarrassing' fact to Norwegians, who stated that climbing was a typical Norwegian sport.

Case report. Norsk Tindeklub was established in 1908, and during the following years its members conquered a series of unclimbed peaks in northern Norway, some of which had denied the efforts of well-known Englishmen. The Norwegian climbers were extremely proud of this, and took it as proof of victory over both the mountains and the climbers (and their nations!) who had failed

to climb them. It was perceived as a turning point in the development of Norwegian climbing, a point which all of climbing-history in Norway led up to: the Norwegians had finally 'taken the lead' on their own home ground. The club-members used these conquests and this understanding of history as a crucial part in their efforts in spreading the sport of climbing in Norway. They represented it as a sport where absolutely no competition should occur, while at the same time exhibiting a pride over the 'victories' they had reached in the competition with other countries' climbers, using it to stir up their countrymen's enthusiasm for the sport. It is this contradiction we want to discuss in our presentation. It is an issue, we think, that is also relevant today. The notion of climbing and other related sports as fields not fitting for competition, is often matched with a focus of doing things not done before; in climbing doing new climbs and new routes. It is a kind of competition, but it belongs to a different ethos than that of modern sport.

Czech research and international trends in outdoor experiential education

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Aim. Over the past decade there has been limited publication in journals in the outdoor experiential education field (AJOE, JEE, JAEOL) of non-English-language perspectives (Thomas, Allison, & Potter, 2009), although there has been acknowledgement of non-English-language terminology (Turčová, Martin, & Neuman, 2005). The indigenous nature of the Czech turistika activities (Martin, Turčová, & Neuman, 2007) and the dramaturgy methods of creative course design have also attracted recent attention (Kudláček, Bocarro, Jirásek & Hanuš, 2009; Martin, 2001; Martin, Leberman & Neill, 2002). This presentation will provide an overview of further Czech research and builds on the meta-analysis summarized by Bartůněk, Neuman and Martin (2008). These findings will then be linked to recent international trends in outdoor experiential education.

Methods. Recent Czech outdoor experiential education research sources will be analysed. These sources are primarily from doctoral and master theses (www.theses.cz), particularly from the three biggest universities Charles University Prague, Masaryk University Brno and Palacky University Olomouc, which have specific departments and related programs of turistika, outdoor sports and outdoor education; sport studies; and recreology (leisure studies), respectively. Other sources are from Czech research journals in the field.

Results. Preliminary findings indicate that outdoor research in the Czech Republic has developed since the foundation of the International Mountain and Outdoor Sport conferences (Charles University, 2004), the Journal of Outdoor Activities (University J.E. Purkyně Ústí nad Labem, 2008), and the e-journal for theory and research Gymnos Akadémos (Palacky University Olomouc, 2010). Most studies are inspired by foreign (English language) theories and methods. The number of studies discussing the influence of "zážitková pedagogika" has increased. However, the difference in understanding of this Czech term makes comparison with foreign terms difficult (Experiential Education, Adventure Education, Experiential Learning, Erlebnispädagogik, Abenteurpädagogik).

Conclusion. The field of outdoor experiential education still suffers from cultural (English and non-English) terminology misunderstanding. Research aims often provide no causal relation between activities for teaching and activities for research. There is a need for more collaborative cross cultural (language) research to provide greater understanding of these context specific differences and perspectives.

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The influence of risk parameters on difficulty rating systems in mountain biking

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Aim. In many Outdoor sports difficulty scales are obligatory. For instance the International Scale of River Difficulty is a standardized scale used to rate the safety of a river. This scale is used all over the world. In rock climbing different kinds of difficulty scales have been established. To ensure comparability the UIAA (International Mountaineering and Climbing federation) developed a table showing the relationship of difficulty grades between the different scales. However, in mountain biking there are numerous types of different scales that have spread locally. Most of the difficulty scales in mountain biking just reflect the technical difficulty of the trail itself, but give no information about risk parameters like steep slopes or sharp stones that surround the trail. The practical experience shows that especially mountain bike novices are strongly influenced by these parameters. The aim of this study was to quantify how much these surrounding parameters influence mountain bike riders of different skill levels when rating the difficulty of a mountain bike trail.

Methods. 29 Subjects (12 Mountain bike novices, 17 Experts) volunteered to participate in this study. They had to analyze and rate 18 Mountain bike riding situations of different skill levels. These were shown on pictures and were randomly presented to each subject separately. While analyzing the pictures gaze behavior of the subjects was recorded by a Tobii Eye tracking System (Tobii Glasses, www.tobii.com). Data was analyzed by using the Tobii Studio Eye Tracking Software Version 3.1 (Tobii Glasses, www.tobii.com).

Results. Gaze behavior of mountain bike novices and experts differ significantly. While experts mostly focus on the trail itself to analyze its grade of difficulty, novices observe the surrounding risk parameters. In some cases the novices gaze these risk parameters

more intensive than the trail. Furthermore, experts examine single key sections on the trail while novices just get an overview of the trail.

Conclusion. The results show that novices and experts are differently influenced by risk parameters that surround the trail. Consequently these parameters should be included in a mountain bike difficulty rating system that is valid for every mountain bike skill level.

The necessity for organization management and development of a qualification system in the outdoor sector: a case study of Estonia

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Backround. In the context where the outdoor sector (outdoor recreation, outdoor activities, outdoor pursuits, adventure tourism or adventure sports, ecotourism, nature based tourism etc.) is a substantial part of the overall 'Sport & Active Leisure' scene the need for qualified providers or program managers grows. Outdoor recreation influences the human-environment relationship, is a form of human behaviour, and is voluntary free time activity that occurs is the outdoors. Outdoor recreation as a phenomenon involves knowledge in areas such as environmental studies, social psychology and economics, which support the balanced development of the sector.

Case Report. In Estonia the sector is in need of organization. Emerging issues are a lack of common understanding of the phenomenon, economic structure, clear legislation, risk management, and an unsatisfactory qualification system. Despite the recent economic recession that adjusted the market in many ways, including active leisure markets, the number of participants in different forms of outdoor activities has been growing remarkably, and the number of providers has not decreased in Estonia. Therefore the facilities and conditions provided for recreational use in the outdoors are being developed. But in order to provide balanced development of the sector, there is a need to focus on more aspects than just making the outdoors available for multiple use. This paper discusses the issues Estonia is facing at the moment and raises questions about the need for organizational management and the development of a qualification system in the outdoor sector.

Sustainability of single trail biking in the Rychleby Mountains

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Aim. In our paper we present a pilot study of selected environmental aspects of a prominent single trail biking area developing in the Černá Voda forests of the remote Rychleby Mountains. As a typical example of postmodern outdoor challenge sport activities generally referred to as lifestyle sports, single trail biking in Czech Republic has experienced an enormous growth in popularity over the last few years. While a growing number of bike parks are open to bring summer visitors to existing or newly built ski resorts, Rychlebské stezky single trails are specific by popularizing a pristine part of landscape among a completely new clientele. On one hand it is bringing business and job opportunities to an economically struggling region, on the other hand the place is faced with a number of new cultural and environmental challenges. In this sense the situation in Černá Voda offers a rare opportunity to observe the processes of transformation of local landscape connected with challenge sport tourism development in "live" action. It is an open end story.

Methods. The study combines analysis and synthesis of findings regarding relevant legislation with available secondary data on local game keeping between 2006 and 2011 and primary qualitative observation data collected over the period 2011 and 2012. During the period, longitudinal photo monitoring and observation was conducted at 30 different locations.

Results. The studied factors reflect the current legislation relevant to the project, including the Nature and landscape protection Act nr. 114/1992, the Forest Act nr. 289/1995, the Water Act nr. 254/2001, the 100/2001 Act on the evaluation of environmental impacts, the European Commission 92/43 Directive from 21st May 1992, and the Natura 2000 instruction. Inevitably, the study also reflects the cultural and political context and tradition of outdoor activities in the Czech Republic. A wide range of aspects needed to be considered, from flora and fauna protection, through forestry and hunting, to landscape management and soil erosion. Despite the massive growth of visit rate on the trails, our findings reveal no significant growth in observed environmental risks for the period except for a temporary increase of certain type of game migration in years 2008 and 2009 and increase of soil erosion and off-trail riding on several portions of the trail. The photo monitoring documents rather quick restoration of balance at the critical sections of the trail after modifications took place.

Conclusion. Observation and analysis of the processes of change should help to anticipate potential future environmental conflicts and thus contribute to the sustainability of single trail biking in the Rychleby mountains region. The confrontation of our data with the studied legislation identified several potentially problematic areas which might have negative impact on the sustainability of trail biking in the area if not properly addressed in near future. We must also point out that social changes in the human landscape of the micro region are yet to be studied.

Frequency of climbing ascents on the selected sandstone towers in the Prachov Rocks in 1944 - 2011

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Aim. The main aim of the research is to analyze the frequency of rock climbing ascents on sandstone rocks in the Prachov Rocks in Czech Paradise in the years 1944 - 2011. The research was initiated by members of Protected Landscape Area of Czech Paradise. The research questions were: What is the development of frequency of climbs in individual areas of Czech Paradise? Is the protection of the newly declared UNESCO Geopark of Czech Paradise, established in 2005, endangered by climbing activities currently more than in the past? Should the climbing activities in the newly declared Geopark of Czech Paradise be reduced due to overloading of rocks by climbers?

Methods. We processed data acquired from summit books, which are installed on the top of each individual sandstone tower. Having reached the summit, each climber notes data concerning the date of ascent, name of the route he/she has climbed, his/her name and the name of the climbing club. Data were processed from 34 summits books. Historical books are stored in the archives of the Climbing

Club of Prachov. For the latest records it was necessary to ascend each tower and process the data straight in the field. 23746 records were evaluated in total. We selected intentionally the most frequently climbed towers with routes of different levels of difficulty, which offer comprehensive archival records. The research sample consists of the towers of Prachovská jehla (Prachov Needle), Drážďanská věž (Dresden Tower), Smítkova věž (Smitka Tower), Obelisk and Bella Vista. Data has been processed covering the period from 1944 to 2011.

Results. The findings indicated that the frequency of ascents increased rapidly in the early 1960s, when the total number of ascents on all 5 towers exceeded 220 a year. This growing trend continued until the mid 1980s, when the number of ascents per calendar year reached the highest values. The maximum number was 1022 ascents in 1979. Since 1980 the curve has decreased with small fluctuations until 1996, when the number was 155 ascents. Since that year, there has been a slight increase of the number of ascents, which continues to the present, with minor declines. We asked the survey question: "Do you record your name in the summit book after your ascent? ", which was answered by 127 climbers straight in the Prachov Rocks. The answer of 98 respondents (77%) was "always", of 28 respondents (23%) "sometimes", and the answer of no respondent was "never". The hypothesis, that there is a continuous increase in the frequency of climbing towards the present, has not been confirmed.

Conclusion. This work demonstrates that rock climbing does not load local rocks more so than in the past. Based on the historical development of the frequency of ascents in the Prachov Rocks, it is not inevitable to solve the problem of nature protection in the Geopark of Czech Paradise by a ban on climbing activities.

Economic and legal aspects of sports and other outdoor activities in organizations

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Aim. This article highlights problems in the management of small (not for profit) outdoor sport organizations for example ignorance of tax laws in various transactions can result in serious future cash flow problems. Large organizations often use the professional services of consultants, but smaller clubs often rely on a single reporting person, typically one of the committee members. This article analyzes some complex cases of tax penalties risked by outdoor sports clubs and identifies some problem areas for sports organizations, which should be subject to deeper analysis.

Methods. We used a method of analysis of legal norms, the method of comparison of the various impacts of each solution.

Results. Management problems related to outdoor sport organizations can be divided into several areas. In this paper we describe three selected issues:

1) Contradiction between the goals of members and employees

Most outdoor sports clubs offer services to the public for a fee. These services often require employees who receive wages. Employees demand higher wages while the club members want higher profits. Czech legislation does not allow managers to distribute profit among members but allows them to pay employee bonuses. The interests of employees and members potentially contradict. Committee members often have the power to decide on the use of profits. Most often the members of the club are also employees. Therefore it is a matter of ethics how the management of a club addresses the issue of expenses.

2) Calculation of overheads on the main economic activity

Sports organizations use subsidies to cover the costs necessary to materialize their mission. Funds from subsidies and grants often cannot be used to cover costs of business activities. Overhead costs must be covered by a subsidy from the designated share.

3) Marketing plan for sports organizations

Organizations must differentiate between information distributed to customers and their members in the formulation of their marketing plans. It is necessary to establish a separate marketing plan for sponsors and donors. Our article explains the difference between these groups.

Conclusion. According to our findings, members of sports clubs should not be at the same time employees of the club. If some persons are members of the club, while being its employees they should not take part on the costs distribution decision making process. The economy of outdoor sports clubs which perform business activities must be entrusted to a specialist. It is necessary to establish a separate marketing plan for each target group.

The state of skiing and snowboarding teaching at primary schools in South Bohemia

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Aim. The aim of the study was to analyse the participation in school skiing and snowboarding courses among primary children in South Bohemia.

Methods. The main experimental method of this study is a questionnaire and its statistical processing. The reason for using that method was relatively easy, fast, and economically modest obtaining of the information from a large number of respondents. The pupils from the second grade of primary schools in South Bohemia form the basis of our research. In total 17 schools were selected, 696 pupils (373 boys and 323 girls) filled the questionnaire. Our own questionnaire was created for the research. A pilot examination was performed in class 9 at the primary school in Lomnice/Lužnicí. The understandability of the questions was tested on a sample of 20 pupils, the assigning was practiced and the time needed for filling the questionnaire was verified.

Results. The average number of days that children spend on the mountains is 5.4 days, boys 6.1 and girls 4.7. In total 82% schools organize winter training course regularly each year. The teaching of skiing predominates in winter courses; only 40% schools offer also snowboarding education. 53 % pupils indicated themselves as excellent skiers; 17% pupils can't ski but would like to learn it in the future. In snowboarding only 23% pupils indicated themselves as excellent riders; 45% pupils can't snowboard, but would like to learn it in the future. The situation in families is also similar, where 59% fathers, 49% mothers and 52% siblings can ski, while in snowboarding these numbers are disproportionately smaller, only 7% fathers, 2% mothers and 21% siblings can ride the snowboard.

Conclusion. Teaching of skiing is only voluntary in the Czech Republic nowadays. It depends on each school if it gets a sufficient number of children for a skiing course. It is much worse with snowboarding, because only a few schools offer the opportunity for teaching of snowboarding. That is why it is very difficult for children to learn this sport. Most parents cannot ride the snowboard and most schools do not offer the teaching of snowboarding too.

An update on liability issues in climbing activities

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Aim. The paper presents a recent study illustrating the complexity of liability issues in outdoor challenge sports with a focus on climbing. Each case needs to be evaluated individually, with respect to its specific aspects, resulting from the certain situation and all relevant factors. As it is not possible to create any generalization of possible cases of a contributory fault, one general universal solution can't be provided. Because there is no set standard assessment methodology and thus standard legal interpretation guidelines for all cases that occur it appears necessary to create an updated collection of case law as well as a regular up-to-date review of related legislative.

Methods. Analysis and synthesis of findings. Review of existing legislative and case law.

Results. Our findings bring forth the fact that is not possible to free oneself from the liability for possible results by claiming a statement that mountain climbing or a participation in a climbing course, or activities at heights when using mountain climbing tools is performed at one's own risk. As a citizen one is obliged to avoid acting in a risky or dangerous manner that means one must abstain in doing any activities that may lead to creation of dangerous situations and creation of damage. In case of the actual performance of danger and risky activities done with the goal to bring a social benefit, like when teaching mountain climbing, one must keep the best possible caution and all safety precautions.

Conclusion. The objective criteria of caution is that everyone keeps the same level of caution, which is a model of average cautious individual, however, higher level of caution is required from those whose perform such activities professionally, that is a higher level of the needed caution from the instructor. If a climbing instructor has not got the necessary information, abilities or skills for the performance of their work, they are obliged to find out and gain such information, abilities or skills, or he must not perform any dangerous activities. An instructor working for a civic association or for an organization with legal entity is not liable for damage, if such damage occurs. Pursuant to the Civil Code, it is the organization that covers the compensation for the damage. However, the instructor is liable for his acting or negligence, as per the Criminal Code. Unexpected causal course of an accident is not contained in the fault, therefore no one is liable for that. Thus between the breach of the required caution and the result must be a causal link. It is not possible to free oneself from the liability by making an agreement with the injured person before the start of climbing, or before the climbing course. Life and health are protected in the Criminal Code in all cases, even without the consent of the damaged. Legal theory and the usual practice in judicature accept also duties that are not specified by law, breaching of which brings legal liability, inclusive of the criminal law liability. For example these are sport rules, technical standards, and manuals for the use of mountain climbing tools.