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Feeling the extreme: An exploratory study of experienced emotions during extreme sport

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Abstract (English)

In the current study13 BASE-jumpers and 18 skydivers reported their emotions immediately after a jump and after a 24 hours delay, using verbal (Likert-like scales) and visual (Feelometer) emotional report. Heart rate measures were also collected during, and 24 hours after the jump. The Feelometer is a newly developed tool enabling the participants to give a moment-to-moment report from a particular event or episode. Given the complexity and dynamics of extreme sport experiences, the Feelometer is a promising supplement to verbal reports when it comes to measuring emotional feelings. Compared with everyday episodes, the results from the current study suggest that extreme sport episodes produce more heterogenous feeling states with a clear distinction between otherwise relatively similar feelings. The Feelometer further revealed that during the jump, participants experienced huge variation in pleasure, but relatively stable levels of interest. The variation reported for pleasure suggests that it is hard to summarize an extreme sport event on a verbal rating scale, intented to cover the entire episode. This result may explain why the study did not find any significant correlations between verbally and visually reported immediate pleasure. However, in retrospect the verbal and visualized reported emotions correlated significantly.

Key words: extreme sport, emotions, pleasure, engagement, heart rate, arousal, BASE jumping, parachute jumping

Abstract (Norsk)

I denne studien rapporterte 13 BASE-hoppere og 18 fallskjermhoppere sine emosjonelle opplevelser, både verbalt (gjennom Likert-skalaer) og visuelt (gjennom et følometer) umiddelbart etter et hopp og et døgn senere. Hjerterate ble også målt under hoppet, og 24 timer senere. Følometeret er et nyutviklet verktøy hvor forsøkspersonene kan gi en kontinuerlig rapport fra en spesiell hendelse, eller episode. Gitt den store kompleksiteten og dynamikken i ekstremsportsopplevelser, er Følometeret et lovende supplement for måling av emosjoner, i tillegg til ordinær verbal rapport. Sammenlignet med vanlige hverdagsopplevelser tyder resultatene i denne studien på at episoder innen ekstremsport oppleves med et mer hetrogent register av følelser, og at det i tillegg er et klart skille mellom følelser som til vanlig oppleves som ganske like. Følometeret viser også at deltagerne opplever en stor variasjon i følelse av velbehag, men et relativt stabilt nivå av interesse. Den opplevde variasjonen av velbehag, kan gjøre det vanskelig å gi en samlet vurdering på en verbal skala, som utgangspunktet skal dekke hele episoden under ett. Dette kan forklare hvorfor det ikke var noen signifikant sammenheng mellom verbalt og visuelt rapporterte følelser i dette studiet. I retrospekt korrelerer derimot de verbale og visualiserte emosjonene signifikant.

Key words: extreme sport, emotions, pleasure, engagement, heart rate, arousal, BASE jumping, parachute jumping

”Do you think anybody in the entire world have had as much fun as we had today? I don’t think so, I don’t think it is possible”. This conversation took place between two BASE jumpers immediately after a jump in Romsdalen, in the western part of Norway (CBS News, 2009) and may hint at why some people jeopardize their life and health by throwing themselves off cliffs or out of airplanes. Again and again, skydivers and other extreme sport athletes refer to the intense experience as the principal motivation for what they are doing (Willig, 2008). However, even if extreme sport is a rapidly growing phenomenon in the western world (Campbell & Johnson, 2005; Celsi, Rose, & Leigh, 1993; Puchan, 2004; Slanger & Rudestam, 1997; Soreide, Ellingsen, & Knutson, 2007; Willig, 2008), surprisingly few researchers have investigated the trend scientifically. For instance, a search in the database PsycINFO gives only 6 hits for “extreme sport” and no hits for combining “extreme sport” with terms such as ”emotion” or “subjective experiences”. Hence, the overarching aim of the current study was to enhance our understanding of the emotional feelings of extreme sport events, concentrating on BASE jumpers and skydivers.

High arousal is reported to cause a short term memory deficit that impairs the ability to report immediate emotions (Revelle & Loftus, 1992). For extreme sport, high arousal is an inherent part of the event, possibly making it difficult to capture the immediate subjective experience. A delayed assessment is, on the other hand, prone to a range of retrospective biases (Kahneman, 1999; Robinson & Clore, 2002a, 2002b). To remedy this situation we have chosen to do two assessments, one immediately after the episode (the jump) and one after a 24 hours delay. A second aim of this study was to see if there is any difference in reporting ones emotions immediately after the episode, compared to the following day.

Even though the activities produce pleasurable experiences like thrill and joy, this is not necessarily the most important driving force behind the activities (Willig, 2008). Instead of being led by spontaneous choices, merely being a vehicle of potential self-destruction, the

activity is carefully staged, leaving the challenge on the edge, yet within the participant's capabilities. However, pushing the limits may not be pleasant at all. Several studies report that high arousal is associated with a range of unpleasant emotions (Thayer, 1989; Willig, 2008). A third goal for our research was therefore to see if the emotions experienced during extreme sport group together as normally reported in everyday situations, namely as positive emotions and negative emotions respectively

Extreme Sport

The term "extreme sport" is not easily defined nor is it easily delimited, but it may be defined as recreational physical activity that carries a risk of serious physical injury or even death (Willig, 2008). The term "extreme sport" has become a well-known label for relatively new activities like climbing, bungee jumping, free ride skiing and snowboarding, surfing, hang gliding and paragliding, kayaking, rafting, small plane aerobatics, full contact marital art, skydiving and BASE-jumping (Slanger & Rudestam, 1997; Soreide, et al., 2007; Willig, 2008). These new activities are becoming more and more popular. In US participation in traditional sports grew by 1,8 per cent between 1978 and 2002, while what is called alternative sports rose by more than 244 per cent during the same period (Puchan, 2004). Campel and Johnson (2005) reported that over 5 per cent of the adult population was taking part in at least one adventure activity on regular basis, and further that 12 per cent would like to participate. In addition Celsi and colleges report that the demographics of the participants has broaden to include people of all ages and an increasing number of women (Celsi, et al., 1993).

How Dangerous Are Extreme Sports?

Not all of these activities are truly risk associated. A distinction should be made regarding the potential risk associated with the different activities. In a study on motivation in high-risk sport, Slanger and Rudestam (1997) distinguished between high-risk participants and extreme risk participants within rock climbing, white water kayaking, skiing and small plane aerobatic. The high-risk participants would typically conduct the same activity but allow themselves a bigger margin for error than the participants in the extreme risk group. The skiers in their study are free-ride skiers, where both the high-risk and extreme-risk participants ski steep mountains and drop from rocks and cornices into steep couloirs and steep rocky faces. The difference between the two groups is in the size and nature of the landing area. The extreme-risk participants would land on small snow patches often surrounded by rocks, where a miss calculation would lead to serious injury or death. The high-risk participants, however, would choose bigger snow patches or snowfields where a miss calculation or fall would not be fatal.

The same distinction is made between the white water kayakers. Rapids are graded from1 trough 6 by the International River Grading system. High-risk participants would negotiate grade 5 but choose not to paddle grade 6, where extreme risk participants would repeatedly paddle grade 6. The climbers were all experienced multi pitch rock climbers. The high risk group would climb long and demanding routs using rope and artificial belay equipment, where the extreme risk participants would climb solo using no rope or belay equipment and where a fall, consequently, would be fatal.

The small plane aerobatic pilots are all conducting the same manoeuvres, but at different altitude. Where the high-risk participants are doing their aerobatics at high altitude and would have time to correct a wrong manoeuvre, the extreme risk participants would instantly hit the ground.

However, to divide between extreme-risk athletes and high-risk athletes seems to be a to narrow definition of extreme sport, and have little in common with several of the activities mentioned initially. Willig (2008) operates with a much wider definition of extreme sports, and also includes the words dangerous sport and high-risk sport in her search for relevant publications, on the topic extreme sport. Activities like bungee jumping, skydiving, skate and snowboarding, surfing, hang and paragliding, kayaking, rafting, canyoning and rock-climbing sort under this umbrella. These are all risk-associated activities, but the level of risk is much lower compared to the activities performed by the extreme-risk participants in the study of Slanger and Rudestam (1997). By including the activities above, we are led to a much wider definition of extreme sports.

As an example, Dahl (2008) estimates that about 30 000 people in Norway conduct some form of climbing on a regular basis. But that is not to say that Norway is a nation of extreme sport athletes. Only a handful of these are doing high altitude rock climbing, or free-solo rock climbing, ice-climbing or difficult technical climbing and big wall climbing. Whereas in- and outdoor sport climbing are low risk activities, high altitude mountain climbing is associated with a significant mortality rate. The world's second highest mountain, K2, is also one of the most dangerous mountains in the world. K2 has a summit/fatality rate of nearly 26 per cent, meaning that for every 100 climbers returning after successfully having reached the summit, 26 have died trying (Peron, 2009).

As we have seen, a lot of activities may sort under the term "extreme sports". One of the most prominent activities in this category is skydiving. The risk in regular skydiving has been estimated to be around 5 deaths and 140-170 injuries per 100.000 parachute jump, and annually leading to 30 – 40 deaths in United States (Soreide, et al., 2007). BASE-jumping is a more extreme and significantly more dangerous form of parachuting. BASE is an acronym for building, antenna, span and earth, and thus represents fixed objects. There are many

similarities between skydiving and BASE-jumping, but there are also distinct differences that force the BASE jumpers to deal with a greater spectrum of hazards. Unlike regular skydiving, the BASE-jumpers normally carry no reserve parachute, and the jumps are often made from lower altitude and consequently the chute is deployed closer to ground. According to Pedersen (1997), BASE-jumping is ranked among the most dangerous sports in the world. The jumps are conducted from virtually anything high and overhanging enough. The high cliffs like El Capitan in Yosemite national park in the US, the Troll wall in Romsdal and the Kjerag massif in Lysefjorden in Norway are ranging from 1000 to almost 2000 meters, and provide the BASE jumpers with altitude enough to appreciate up to almost one minute of freefall. But BASE jumping is also conducted from significantly lower objects like antennas, bridges or houses, some no more than 35 meters tall.

To summarize, it seems difficult to make a distinction among risk -associated activities, segregating the extreme from the high or medium risk activities. The main reason is that the subjective experience of extreme sports depends on factors other than the objective calculation of risk. The question that arises is whether extreme sport can be defined as a set of activities or if we rather should turn to the personal experience of the activity? Because, what may be extreme sport for some, might just be a normal everyday experience to others. In this study we will seek to increase our knowledge of extreme sport by trying to measure emotions in these situations.

The Phenomenological Content of Emotion Experience

Emotions have been studied extensively trough out the history of modern psychology. A full review of the different theories and evolving research is beyond the scope of this text (for an extensive review see: Lambie & Marcel, 2002). In this exploratory study our primary aim was to find a functional approach for measuring emotions in extreme situations. We will

therefore not go in depth on the different views on emotions, but define an emotional experience as a conscious mental state, or mental representation that, at least in principle, can be reported. A mental representation of an emotion may consist of past feelings (memories), hypothetical feelings (imaginings) or feelings that are occurring in the moment (online) (Barrett, Mesquita, Ochsner, & Gross, 2007).

One line of research suggests that the most basic structures of emotional experiences can be described along the two factors: valence and arousal (Corson & Verrier, 2007; Feldman, 1995; Hurlemann, et al., 2005; Russell, 1980; Yik, Russell, Ahn, Dols, & Suzuki, 2002). Valence describes the quality or direction, while arousal describes the quantity or intensity of the emotional experience. Arousal is one of the defining characteristics of an extreme sport experience where the athletes are fully concentrated and attentive to every little detail. These extreme experiences make a lasting impression in memory and can be re-experienced and passed on to others time and time over again. However, high arousal also impairs the immediate recall of the events just experienced, thus posing a challenge to the measure of emotions in extreme situations.

Arousal

In everyday terms, to be aroused means to be wide awake, excited, vigorous and alert. To be unaroused means to be relaxed, sleepy or tired (Revelle & Loftus, 1992; Thayer, 1989). Although there is evidence that arousal consists of a range of separate arousal systems, McGaugh and colleges (1990) have shown how separate arousal systems serve the same function. Arousal may be measured in a variety of ways, from cortical activity like measures of EEG, to autonomic measures like Skin Conductance (SC) and Heart Rate (HR) (Clements, Hafer & Vermillion 1976 in Revelle & Loftus, 1992; Thayer, 1989).

In moderate levels, arousal can be experiences as feelings such as peppiness and vigor. However, at very high levels arousal may be experienced as tense and unpleasant (Thayer, 1989). Revelle and Loftshus (1992) argue that variations in arousal may be serving the function of varying the resources available for information processing. Further they point to several studies showing that high arousal at encoding facilitates both detection and encoding for long-term retrieval, but may also lead to an inability to retrieve information for a short period of time, up to 30 minutes, after the original experience (Revelle & Loftus, 1992), Kleinsmith and Kaplan (1963) found that arousing words were better remembered after one week than they had been two minutes after learning. This is in line with the research on stress hormones, in which high arousal has been shown to increase the ability to retrieve information in the long run (Civettini & Redlawsk, 2009).

However, this deficit of immediate retrieval may not entirely be due to high arousal at encoding. Because, if the participant has a high level of arousal during the episode, there is a great chance that he still has a high level of arousal during the assessment immediately after. Miller, Styles and Wastall (1980) stated: "Therefore the change in immediate memory performance (...) may be due as much to the influence of arousal upon retrieval as upon learning or, indeed, a subtle interaction between the two processes" (p. 408).

There has been offered several theoretical explanations for the effect arousal has upon detection, retrieval, utilization and the inability to retrieve information immediately after a high arousal experience. One of the most interesting theories is the "tick rate hypothesis" (Humphreys & Revelle, 1984; Revelle & Loftus, 1992), which proposes that arousal increases the rate at which the environment is sampled. This hypothesis predicts that higher level of arousal should lead to a faster rate of response to environmental cues. But at the same time, this increased sampling rate leads to a decrease in available mental energy for memory retrieval in the short run.

It has also been argued that an experience of emotion can be outside the phenomenal awareness and therefore not represented in the working memory (Larsen & Fredrickson, 1999). Thus, people will be unable to perceive and report the emotions accurately. Moreover, one could question whether an unperceived emotion is an emotion at all.

It seems possible that a person may have an emotion in a nonverbal channel, like autonomic activation or action tendency, yet never label the experience and therefore not perceive it as an emotion. Further, some people may also repress emotions resulting in an incomplete or biased memory of emotion. This may have several causes, but high arousal has been reported to lead to false memories (for further arguments see Corson & Verrier, 2007). Given the effect arousal has on the immediate retrieval, self-reported emotions may be severely biased if administered immediately after an extreme sport experience. However, memory is grinded by time, making the report of an experience prone to an increasing range of biases.

Sources of Information In Self-Report

Robinson and Clore (2002a) argue that people prefer to use the most specific source of information when reporting their emotions. They suggest that people access at least four types of knowledge, ranging from most to least specific: experiential knowledge, episodic memory, situation-specific belief and identity-related belief. *Experiential knowledge* is a direct access of current emotions. This information can neither be stored nor retrieved. However, trough the *episodic memory,* people can attempt to retrieve specific moments or contextual details from the past. Although past emotional experiences cannot be re-experienced, they can often be reconstructed, aided by this information.

For example, after landing a BASE jumper may remember exit position, the relative speed of the track, the deployment altitude and following canopy ride. Further the BASE

jumper may also remember thinking: “this is a good track” or “this exit is unstable and dangerous”. This labelling of the feelings felt during the jump, but not the feelings itself, will be available for retrospection. But emotion related memory is no different from other types of memory, and therefore the ability to recall contextual details will decline quickly with the passage of time.

Situation-specific beliefs are people’s belief that certain emotions are likely to be experienced in a particular type of situation. For instance, most of us believe that vacations are associated with happiness and death of a loved one lead to sadness. Finally, *Identity-related beliefs* are the beliefs people hold about their emotional experiences in general, like their emotional traits, but also the normative social beliefs.

All of these four sources of information give potentially different information about the individuals` emotional experiences. This may cause people to report differently when completing a self-report, depending on the kind of information being accessed. The online reports will most likely access the state emotions, while retrospective reports will, if no episodic cues are available, most likely access the trait emotions.

Figure 1 shows the different types of knowledge and sources of information that, according to Robinson and Clore (2002a), are tied to the different types of self-reports.

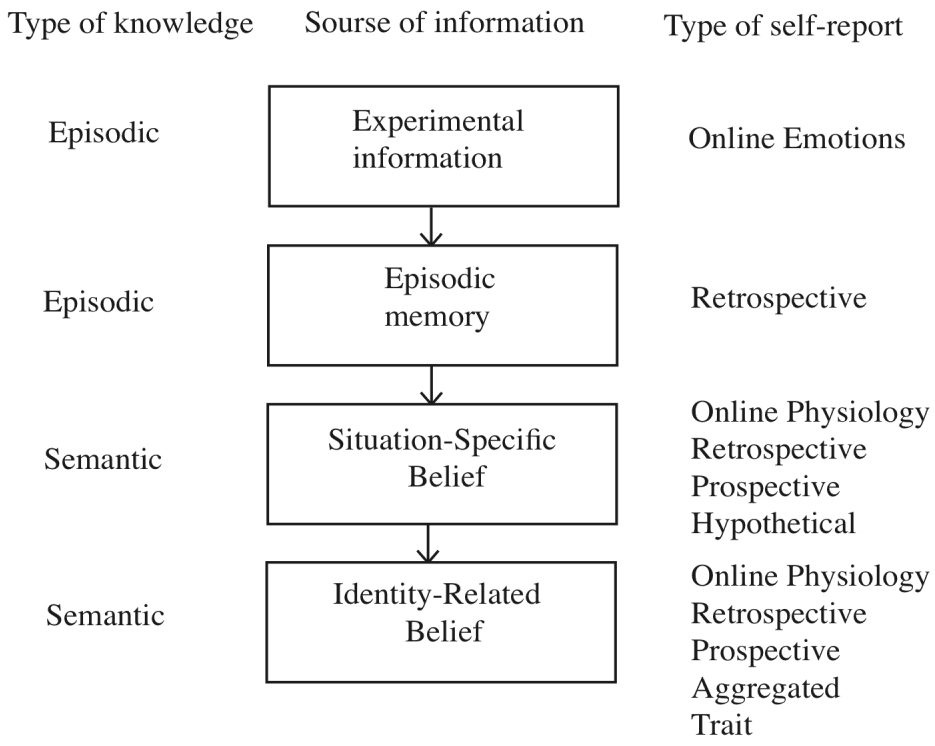

Figure 1. Accessibility Model in Self-Report, Showing the Type of Memory and Sources of Information Used in Different Types of Self-Report. (From Robinson & Clore 2002a)

Personality

Several studies tempt to establish a relationship between distinct personality trait and the preference for, or practice of extreme sport. The most prominent view is the one focusing on sensation seeking (Willig, 2008). According to Breivik (2004), humans have always voluntarily exposed themselves to risk. However, at the start of the 20th century, voluntary exposure to risk was associated with mental illness (Adler, 1930; Deutsch, 1926; Fenichel, 1939 in Slanger & Rudestam, 1997). In a psychoanalytic view, physical risk taking was regarded as counter phobic behaviour and expressive of a death wish. Anna Freud reported that the high-risk activity served the function of tempering anxieties about "masculine inadequacy", or "castration fear" (Huberman, 1968, cited in Slanger & Rudestam, 1997).

This view is still somewhat prominent today. Theories about health are based on the assumption that people always act in the pursuit of health and longevity (Willig, 2008).

Health is therefore seen as the rational choice, and all behaviour that contradicts this goal is easily seen as aberrations or problems yet unsolved. Unsafe sex practice among gay men, for example, tends to be presented as an addiction rather than voluntary behaviour (Crossley, 2004). Willig (2008) suggests an alternative view of behavioural choices that do not prioritize health and safety. Instead of seeing these choices as a product of psychopathology, or generated by a cognitive bias, she points out that there could be "more than one rationality". Despite the fact that it sometimes is hard to understand why people act as they do, psychological science is bound to make efforts to explain behaviour, even when they appear as quite a puzzle.

In the middle of the 20th century, Hebb pointed out that a number of human activities such as skydiving or racing cars at high speed served the function of raising the individuals level of stimulation and excitement (Slanger & Rudestam, 1997). In 1955 Leuba developed the concept of optimal stimulation. This was later supported by the work on sensory deprivation conducted by Lilly and Hebb (Slanger & Rudestam, 1997). Different individual seek different levels of stimulation to avoid boredom. There have been given different reasons for this risk seeking. Sociologist's focus on the way society may affect the individual's decision to participate in extreme sport. A full discussion is beyond the scope of this text, however, two major lines of research deserve attention, namely, compensation and adaption. Some argue that risk seeking is an escape, and a way of compensating for the` boundaries set up by society (Midol & Broyer, 1995; Milovanovic, 2005) Other sociologists argue that participating in extreme sports is a way of adapting to the values of late modernity, like individualism and individual achievement (Arnegård, 2006; Crosset & Beal, 1997; Geoffman, 1967; Palmer, 2004).

Within the framework of psychology, the concept of sensation seeking has been given much attention. This concept builds on the theory of optimal stimulation. Studies on

sensation seeking typically use Zuckerman's sensation seeking scale and also its thrill and adventure seeking subscale, deployed on an experimental group of extreme sport athletes and a control group of people not conducting any extreme sport. Maybe not surprisingly, significant changes tend to occur between the two groups, showing that extreme sport athletes do indeed have a preference for novel high-risk activities (Diehm & Armatas, 2004; Franques, et al., 2003; Slanger & Rudestam, 1997).

It could be argued that sensation seeking is a precondition for engaging in some form of extreme sport. However, the correlation between sensation seeking and the chosen leisure activity is modest across a range of studies, explaining only 10 per cent of the variance in behaviour (Furnham, 2004). Furthermore the concept of sensation seeking does not explain why people will take risks in one area of their lives and not in others. Left unexplained is also the need for mastery and achievement, often mentioned by the risk takers themselves. (Balint 1959; Hubermann 1968; Klausner, 1968 in Slanger & Rudestam, 1997). Therefore, other factors must also contribute to the initiation of extreme sport.

Meaning and Motivation

A few studies have concerned themselves with the meaning and motivations behind extreme sport (Celsi, et al., 1993; Larkin & Griffiths, 2004; Willig, 2008). Celsi et al. (1993) conducted an ethnographic study of skydivers, and the skydiving community at a drop zone. A combination of observational data and interviews revealed a dynamic process of motivational change, as the individuals progressed from novices to experienced jumpers. Interpersonal and hedonic motives tend to be the main reason for initiation (e.g., friends asking them to try the sport, and the search for "thrills"). Further, the opportunity to construct a new personal identity and the desire to achieve mastery and status were motives for staying involved. With increasing involvement the jumpers were motivated by what Celsi et al.

(1993) call "higher order values". Finally, the achievement of experiential qualities that transcend normal everyday life became the major motive for taking part.

Another study of five bungee jumpers, revealed several themes representing motives for getting and staying involved (Larkin & Griffiths, 2004). In line with Celsi et al. (1993), initiation themes included influence from other people, and identity was further found to be an important motive for staying involved with the sport.

The two studies depart on the topic of risk management. Whereas Celsi et al. (1993) proposes that the skydivers treat death as a possibility and reality, Griffiths and Larkin (2004) argue that a certain amount of denial is common, and points out several strategies the participants use to minimize their perception of risk, which results in an "optimistic bias" (for a further explanation see Mogahaddam, Stolkin, & Hutcheson, 1997; Weinstein, 1980).

Willig (2008) conducted an interview with eight extreme sport athletes. Three of them were skydivers, three others were experienced mountaineers and the last two practiced a variety of extreme sports. Attempting to identify the basic structure of extreme sport, this study identified four main themes shared by all the participants. These were: Context, Challenge, Suffering, and Other People.

Willig (2008) found that in order for the phenomenon to emerge, the *context* had to meet certain criteria's like the weather, or social conditions, such as the presence og absence of other people. The *challenge* they set for themselves had to be on the edge, yet within their existing capabilities. This means that the phenomenon was brought into being by a careful matching of challenges and abilities, which makes it resembles the description of a flow experience given by Csikszentmihalyi (e.g., 1982). Further, a degree of actual or potential *suffering*, or the possibility of pain or damage, is a key feature. Without this as an option the activity could not be constructed as challenging, and this is an essential quality of the concept

of extreme sports. It was also important for the participants that *other people* knew what they were doing. Being different from the majority was experienced as enjoyable.

A further five themes were shared by at least half of the participants. These included Mastery and Skill, Compulsion, Being in the Present, Contrast and Pleasure (Willig, 2008).

Gaining experience and a sense of *mastery* were experienced as rewarding. Celsie et al. (1993) have also pointed out that psychological factors, such as a sense of mastery, increased self-efficacy and self-esteem, operate as a reward for investing in extreme sport. Further, Willig (2008) argues that to achieve mastery requires discipline and structured learning. It also calls for commitment and a considerable investment of recourses like time, energy and money. Thus, the phenomenon is not of a spontaneous character. Instead it needs carefully construction and nurturing over a long period of time.

Taking part in extreme sport is of *compulsive* nature and the participants found it frightening and also difficult to imagine a life without the sport. Willig (2008) argues that although being carefully and deliberately constructed and nurtured it is not entirely under the participant's control. Yet, this involvement was regarded as something positive, and several of the participants used the extreme sport activities to "charge their batteries".

The participants experienced the sense of *being in the present* as calming and relaxing. Due to an intense focus on the immediate demands of extreme sport, there seems to be no mental space for anything other than the task at hand. All other thoughts, emotions and perceptions are excluded. This state of being, allowed the participants to momentarily be freed from all other everyday worries. Like the previous theme, the participants experienced *being in the present* as both pleasurable and necessary, "providing a means by which participants managed their emotional life" (Willig, 2008 p, 697).

Celsie et al. (1993) found that the experience of flow was the ultimate aim and purpose for the practice of skydiving. Flow describes the unity of self, world and activity as result of total absorption in the activity (For a full explanation see Csikszentmihalyi, 1992).

In contrast, Willig (2008) found a range of diversity of experiences in the different extreme sports. The skydivers, for example, focused more on the social aspect, whereas the mountaineers held the experience of flow as a more central part of their experience.

Many of the participants experienced a *contrast* of apparently contradictory qualities or emotions. For example the beauty and peacefulness of the environment (e.g. the mountain one is climbing or the landscape one is jumping into) may bring about a sense of calmness. Simultaneously, the activity itself may be experienced as physically or mentally challenging. This seen together with the actual or potential suffering experienced while performing the activity, challenges the everyday assumption that suffering is best avoided, and that contradictory feelings are mutually exclusive. Rather the phenomenon accommodates a range of opposing qualities, and generates a possibility for novel emotional experience.

Even though several of the participants in Willig's study emphasized the feelings of happiness and joy, like "feeling high, blissful and magical", *pleasure* were not generally a motive for engaging in extreme sport. In contrast to *challenge* and *compulsion, pleasure* was not described as a driving force behind the participation in extreme sport, it was rather perceived as an enjoyable by-product of the activity.

According to Willig (2008), there seems to be two distinct levels of motivation for engaging in extreme sport. The first is typically rational and purposeful, linked to the desire for *Challenge* and to acquire increasing levels of *Mastery and Skill.* The other motivating force seems to operate on a less conscious level, motivating the participants to repeat an activity that produces otherwise inaccessible feelings of joy and elation.

Instead of falling pray to impulsivity in the search for thrills, extreme sport athletes carefully construct the context for their experiences, placing the goal on the edge, yet within their existing capabilities. This way they can test their own limits without being overwhelmed. This sets the stage for optimal functioning and may also give entrance to subjective emotions the participants cannot access otherwise. The previous studies have adopted a qualitative method. This serves the goal of mapping the underlying structures. In the current study, we wanted to take this approach one step further, by trying to quantify the emotions of extreme sport.

Aims of the study

The major aim of this paper was to investigate emotional experiences among BASE-jumpers and skydivers. Given potential biases in both immediate and recalled self-reports, we have chosen to assess emotions both on-line and in retrospect. The on-line measurement of emotions took place immediately after the jump, The recall data were collected after the participants had been watching a film of themselves jumping. This last assessment took place 24 hours after the actual jump.

A second aim was to investigate the so-called “Repeated assessment bias”, which may occur if questions about the same event is asked several times.

A third aim was to see if the emotional profile of an extreme sport experience differs from emotional profiles in less extreme episodes.

Finally, a last aim of the study was to identify predictors of emotions in extreme situations. Therefore the participants completed a questionnaire in advance, accessing their emotional traits. In addition we also recorded the participants heart rate (HR) both during the jump and while they were primed watching them self on film.

Research questions

Grounded in the above aims, the thesis set out to investigate the following research questions:

1.Repeated assessment bias: Are there any differences in the groups that report their emotions immediately after the jump, and after a 24 hours delay, compared with the group that only report their emotions after a 24 hours delay?

2. Retrospective bias: Are there any differences in emotions reported immediately after the jump compared to after a 24 hours delay?

3. Different expressions of emotions: What are the similarities and differences between extreme sport experiences as measured verbally, visually and physiologically?

4. Emotional distinctiveness: Do the overarching categories of positive emotions and negative emotions apply for the high aroused extreme sport experiences?

5. Well-being indicators and personality traits: To what extent do personality traits or well-being indicators predict extreme sport emotions?

Method

Participants

A total of 31 extreme sport athletes (10.30% females), were investigated during the summer of 2008. The sample comprised 13 BASE jumpers and 18 skydivers, with an age range from 18 to 39 years (M=28.50). The BASE jumpers were recruited by the author at the camping ground in Lysefjorden, below the Kjerag massif, outside Stavanger, in Rogaland county. The Kjerag massif attracts jumpers from all over the world, and the Stavanger BASE association runs a scheduled taxi service bringing the jumpers by car into the mountain, and by boat from the landing area at the fjord and back to the camping ground.

The skydivers were recruited at the drop zone in Voss, in Hordaland county, near the city of Bergen. The drop zone at Voss is the second biggest in Norway, and jumping is conducted seven days a week from 1 May to 1 September. Only extreme sport athletes already jumping with a helmet mounted camera were asked to participate in the study. All participants used their own helmet mounted camera gear. Except from that, there were no other conditions for the selection of participants.

Procedure

The data for our study came from five different sources: three questionnaires and two heart rate measures. The questionnaires assessed (1) background variables (Questionnaire A); (2) subjective experiences immediately after the jump (Questionnaire B); and (3) subjective experiences after 24 hours (Questionnaire C) (See Appendix for questionnaires). The two heart rate measures were recorded (4) during during the jump; and (5) after 24 hours while watching the film.

One day before the jump.

One day before the jump the participants completed Questionnaire A. The participants were first briefed on the study one by one, gave their consent to participate, and were informed that they could withdraw at any time. All information were given anonymously.

Immediately before and during the jump.

The procedure on the day of the jump, from start until exit, was slightly different for the BASE-jumpers and skydivers and will be described separately.

BASE-jumping: Before they participants geared up, they were given the heart rate monitor (HRM), and assisted if needed in mounting it. The author then withdrew after checking that the HRM was working properly. When the participants were ready to jump the author set the HRM on record, and also made sure that the helmet mounted camera was recording. The participants were filmed using two cameras. The first was mounted on the participants' helmet, capturing their point of view, and the other camera was operated by the author, who filmed the exit from a third person's point of view. The third person's point of view was shot as a total picture 5-10 meter to the side of the exit, with the exit point (cliff edge) defining the middle of the frame. From the exit point to the very edge of the frame there was approximately ten meters. The authors` camera was left steady, not following the jumpers as they exited.

Skydiving: The author met up with the skydivers no less than 30 minutes prior to departure. They were given the HRM and assisted, if needed, in mounting it. After they had geared up, the author followed them into the plane and up in the air. No less than five minutes prior to exit the author started the HRM. Before exit, the author also made sure that

the helmet mounted camera was recording. The exit was also here shot as a total picture and the camera was left steady, not following the jumpers as they exited the plane.

Immediately after the jump.

The rest of the procedure is the same for all participants. Five to ten minutes after the participants had landed, and as they were gearing of, their HRM and helmet mounted camera were turned of. Half of the participants where then given a second questionnaire (Questionnaire B), which they filled in within the first 30 minutes after landing. The film from the helmet mounted camera and the author's camera was transferred in full DV quality to the authors Macbook Pro using Firewire and iMovie.

The film was then edited with two clips. The first clip (10 sec.) showed the participants' exit. As the participants left the frame of the first camera, the view shifted to the second clip, recorded by the helmet-mounted camera, which showed the rest of the jump until 10 seconds after landing. The film lasted between two and five minutes, depending on the flight time under canopy.

One day after the jump, the participants met up with the author again. First the HRM was mounted. The participants then completed the initial part of the last questionnaire (Questionnaire C). Next, the participants were shown the film from their own jump. Lastly, they completed the rest of Questionnaire C. HRM was measured during the film, not while the participants were answering the questions.

Assessments

Verbally Reported Emotions

State emotions were measured with the Basic Emotions State Test (BEST – Vittersø, Oelman & Wang, 2009). The scale consists of three items for each of three groups of

feelings; pleasure, engagement and negative emotions. The BEST items were presented after the introduction: ”Draw a circle around the number that best describes your emotions right now”, and for each item participants then reported on a Likert-like response scale running from 1 (Not at all) to 7 (Very true).

The items were initially collapsed into three subscales: Pleasure (*contentment, enjoyment* and *happiness*) (Immediate $\alpha = .74$; Delay $\alpha = .92$, $F(13, 30) = 3.71$, $p < .05$)[1], Engagement (*engagement, interest* and *enthusiasm*) (Immediate $\alpha = .53$. Delay $\alpha = .84$, $F(13, 30) = 2.93$, $p < .05$)) and Negative Emotions (*fear, anger* and *sadness*) (Immediate $\alpha = .33$. Delay $\alpha = .40$, $F(13, 30) = 1.12$, $p > .10$)). Due to the surprisingly low reliability observed for both the Immediate condition and the Delay condition, the three negative emotion-items will be treated as separate emotions, and not as a sumscore variable.

Visually Reported Emotions

The visual scores of pleasure and interest were obtained by a Feelometer. This instrument was developed by Røysamb and Vittersø (J. Vittersø, personal communication 15. March 2008) and enables the participants to provide a moment-to-moment report from the episode. The y-axis shows the intensity of the emotions, and the x-axis is the timeline of the episode. The result is a schematic emotion report that gives the researcher the opportunity to do comparisons at different stages during the episode. Figure 2 shows the six measures we extracted from the Feelometer (1) Height of starting point , (2) Number of peaks, (3) Height of end point, (4) Height of highest point, (5) Height of highest point in the middle of the episode, and (6) Height of lowest point. Note, that for measure 5, starting point and ending point are defined as from the end of the axis and 2.5 cm towards the middle. This leaves 6.5 cm between start and end, which is defined as being the middle of the episode.

[1] According to van de Vijver and Leung (1997) the differences between two alpha values can be tested for significance, using the equation $(1-\alpha 1)/(1-\alpha 2)$. For large samples the statistics follows an F distribution with N1-1 and N2 – 1 degrees of freedom (N1 and N2 are the sample sizes)

The figure below is a compressed example of the one used in the questionnaire. In the questionnaire the x-axis is 6.5 cm and the y-axis is 11.5 cm long.

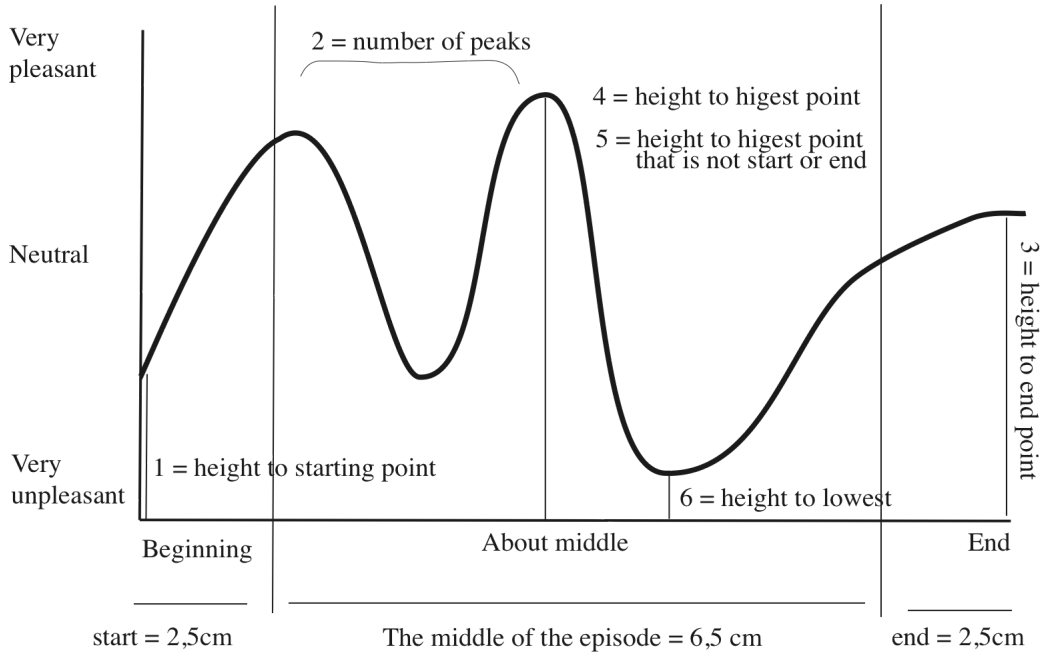

Figure 2
The Feelometer Showing the Six Measuring Points. In measure point nr.5, start and end are defined as 2,5cm horizontal distance from the start or the end of the line.

Skills and experience were measured with three different questions. The first item asked the participants to judge their skills in the specific episode on a response scale ranging from 1 (Not god enough) to 7 (Very good). The second item asked the participants how experienced they consider themselves, with answers ranging from 1 (No experience) to 7 (Very long experience). The last item asked the participants to report their total number of jumps, which is the most prominent factor of experience evaluations used by the participants themselves.

Flow was measured with the Flow Questionnaire (Csikszentmihalyi, 1982), comprising three questions with a Likert-like scale response format running from 1 (Not at all) to 7 (Totally right). An item example is: "My mind was not wandering. I was not thinking of anything else. I was totally involved in what I was doing."

Feeling of freedom was measured by the single question "How strong was your feeling of freedom during this episode?" The participants answered on a seven point Likert-like scale ranging from 1 (Very low feeling of freedom) to 7 (Extremely high feeling of freedom).

Feeling of mastery[2] was also measured with a single question. "How did you cope with this situation?" The answer was also here given on a seven point Likert-like scale ranging from 1 (Not very good) to 7 (Very good).

Heart rate measures

Heart rate (HR) was recorded with a Polar AXN 500 heart rate monitor (HRM). This records both altitude and HR every 5 seconds. The HR measures were imported to a PC using the program Polar Pro Trainer 5. The HR scales were adjusted so that all HR measures started 30 sec prior to exit, and stopped 3 minutes after landing. The recorded altitude defined exit and landing points. After processing the HR was exported to SPSS 16.0 for Mac via Microsoft Exel 2008 for Mac Version 12.1.5.

The film was recorded using a DV camera with a 0.5 wide angel lens. The film was then imported to iMovie HD 6.03 for editing. The film was also shown in fullscreen using iMovie on a Macbook pro 2,5 GHz 15" using Mac earphones.

[2] The Norwegian term "mestring" does not easily translate to English. The direct translation would be somewhere in between manage, cope and master. In this paper, mastery can be understood as a positive attribution of ones skills and way of handling a situation.

Background variables

Life Satisfaction was measured with the Satisfaction With Life Scale (SWLS - Pavot & Diener, 1993). The instrument contains five items such as "I am satisfied with my life". The participants responded on a 7-point Likert-like response format from 1 (strongly disagree) to 7 (strongly agree). The Cronbach's alpha (α) for the scale was .58

Trait Emotions were measured with the Basic Emotions Trait Test (BETT - Vittersø, Dyrdal, & Røysamb, 2005). The scale contains three items for each of six basic emotions, i.e. Pleasure, measured with the items pleased, satisfied and happy (α = .79); Anger, measured with the items angry, frustrated and annoyed (α = .87); Engagement, measured with the items enthusiastic, engaged and inspired (α = .69); Fear, measured with the items fearful, afraid and nervous (α = .78); Sadness, measured with the items sad, blue and depressed (α = .80). The BETT items were presented after the introduction: "Normally I feel..." and for each item participants then reported on a Likert-like response scale running from 1 (never) to 7 (all the time). The Pleasure, Engagement and Interest scales were collapsed into a Positive Trait Emotions sumscore variable (α = .70) and the Anger, Fear, and Sadness scales were collapsed into a Negative Trait Emotions sumscore variable (α = .81)

Personal Growth (PG) was measured with a composite scale comprising four subscales. Curiosity (from Amabile, Hill, Hennessey, & Tighe, 1994) with three items; Absorption (from Kashdan, Rose, & Fincham, 2004) with three items; Complexity (from Cattell's 16P from IPIP, 2002) with three items; and Competence (from Cloninger's TCI from IPIP, 2002) with three items. The participants responded on a five-point Likert-like response format from 1 (strongly disagree) to 5 (strongly agree). Examples of the items are: "I enjoy trying to solve complex problems" (Curiosity), "When I am participating in an activity, I tend to get so involved that I lose track of time" (Absorption), "I love to think up

new ways of doing things" (Complexity) and "I can perform a wide variety of tasks" (Competence). The Cronbach's alpha for the Personal Growth composite scale was .81

Personality traits were measured with the Mini-IPIP scale, a 20-item short form of the Five-Factor Model (Donnellan, Oswald, Baird, & Lucas, 2006). The Mini-IPIP scale consists of four items per trait, two items in each four-item series are reversed. It has proven consistent and acceptable internal consistencies across several studies. The participants responded on a five-point Likert-like response format from 1 (Very inaccurate) to 5 (Very accurate). Examples of the items are: "Am the life of the party" and reversed "Don't talk a lot." (Extraversion). "Sympathize with others feelings" and reversed, "Am not interested in other peoples problems" (Agreeableness). "Get chores done right away" and reversed, "Often forget to put things back into their proper place" (Conscientiousness). "Have frequent mood svings" and reversed, "Am relaxed most of the time" (Neuroticism). "Have a vivid imagination" and reversed, "Am not interested in abstract ideas" (Openness). The Cronbach`s alphas were for Extraversion: .77, Agreeableness: .84, Conscientiousness: .73, Neuroticism: .50, and Openness: .56.

Analyses

Data were analyzed using SPSS 16.0 for Mac. With a sampesize of 30, there is an imminent danger of conducting Type I error. In an attempt to remedy this situation we will consider results with p-values in the range between .05 and .10 as parasignificant.

Results

Repeated Assessment Bias

There were no significant differences between the group that had completed both the questionnaire immediately after the jump (Immediate) and the one distributed after a 24 hours delay (Delayed) and the group that only completed the report after a 24 hours delay. For these two groups, non-significant t-values were found for the verbally reported emotions (5 variables), for the visually reported emotions (12 variables), the flow questionnaire (3 variables) and heart rate (3 variables). Thus, there is no indication that reporting ones emotions immediately after the jump affects the report given after a 24 hours delay.

Retrospective bias

Immediate vs. Delayed Emotions

Verbal reports. The results from the verbally reported emotions are presented in Table 1, showing that the participants tended to report more immediate fear, $t(13) = 1.75$, ($p = .103$) compared to the assessment the following day. Further, none of the participants reported any immediate sadness at all, whereas they did report some sadness the following day $t(13) = 1.74$, ($p = .104$). Immediate and delayed fear were uncorrelated ($r = .11$, $p = .704$), whereas immediate and delayed anger correlated strongly and significantly ($r = .97$, $p < .001$). The two engagement variables correlated significantly ($r = .73$, $p = .003$), as did the pleasantness variables ($r = .55$, $p = .040$).

Table 1
Means (M) Standard Deviation (SD), T -statistics, and Retest Correlations (r) for the Verbally Reported Emotions Immediately After The Jump (Immediate) Versus After a 24 Hours Delay (Delay).

	Immediate		Delay			
Emotion	M	SD	M	SD	t	r
Pleasure	6.25	0.96	6.10	0.89	0.63	.55*
Engagement	6.23	0.70	6.08	0.92	0.29	.73**
Anger	1.69	1.40	1.35	1.05	1.47	.97***
Fear	3.81	1.38	3.00	1.71	1.75†	.11
Sadness	1.00	0.00	1.19	0.48	-1.74†	1)

Note. df =13 for Immediate and 19 for Delay. † = p ≤ .10; * = p ≤ .05; ** = p < .01; *** = p < .001. 1) = Sadness during Immediate had no variance.

Visual reports. Compared with the following day, participants reported less initial pleasure (before the jump) and more pleasure at the end of the episode (after the jump) when assessed immediately after landing (Table 2). A paired-samples t-test confirmed that the differences were significant or para-significant, respectively $t(14) = -2.28$, ($p = .039$) and $t(14) = 1.91$, ($p = .077$). The participants also reported both higher and lower levels of immediate pleasure compared to delayed pleasure, with $t(14) = 2.07$, ($p = .057$) and $t(14) = -1.95$, ($p = 0{,}71$), respectively. Further, they also reported a higher number of immediate pleasure peaks compared to delayed pleasure peaks $t(14) = 2.81$, ($p = .014$).

However, the differences between immediate and delayed experiences were not so evident for visually reported interest. The interest peak was slightly higher immediately after the jump than after 24 hours $t(14) = 1.87$, ($p = .082$), but no other differences reached significance for visualized interest.

This may tell us two things. First the immediate pleasure is more polarized and heterogeneous than delayed pleasure. Further, the change from low initial pleasure to high pleasure in the end of the episode could be seen in conjunction with the high initial level of arousal before the jump, and lover arousal level after landing. It is worth noting that interest is not affected in the same way.

Table 2
Visually Reported Emotions Immediately After (Immediate) the Jump Versus After 24 hours Delay (Delay), Compared Using a Paired-Samples t-test.

		Visually reported emotions					
		Immediate		Delay			
	Pleasure	M	SD	M	SD	T	r
1	Height of starting point	34,40	13,70	43,26	12,09	-2,28*	.33
2	Number of peaks	1,33	0,72	0,73	0,46	2,81*	.07
3	Height of end point	52,80	15,60	46,40	15,89	1,91†	.43
4	Height of highest point	61,53	6,90	57,60	6,34	2,07†	.35
5	Height of highest point that is not start or end	57,00	8,17	55,46	7,14	0,80	.54*
6	Height of lowest point	27,20	13,22	34,00	15,52	-1,95†	.07
	Interest						
1	Height of starting point	50,00	7,20	51,40	9,10	-0,61	.43
2	Number of peaks	1,07	0,70	0,80	0,94	0,94	.13
3	Height of end point	50,03	10,89	45,93	18,41	1,16	.51*
4	Height of highest point	61,14	6,29	59,64	6,39	1,37	.79***
5	Height of highest point that is not start or end	60,33	5,29	56,73	7,39	1,87†	.35
6	Height of lowest point	41,93	8,78	41,13	14,15	0,25	.48†

Note. † = p ≤ .10; * = p ≤ .05; *** = p < .001. N = 15 for Immediate and N = 20 for Delay.

Prototype scoring. All the visualized emotional plots were examined, and eight prototypes were created. All individual plots were then categorized as belonging to one out of these prototypes by two independent raters. The inter-rater reliability was 85%. (see Ross, 1989 for similar procedure) Figure 3 shows the eight prototypes.

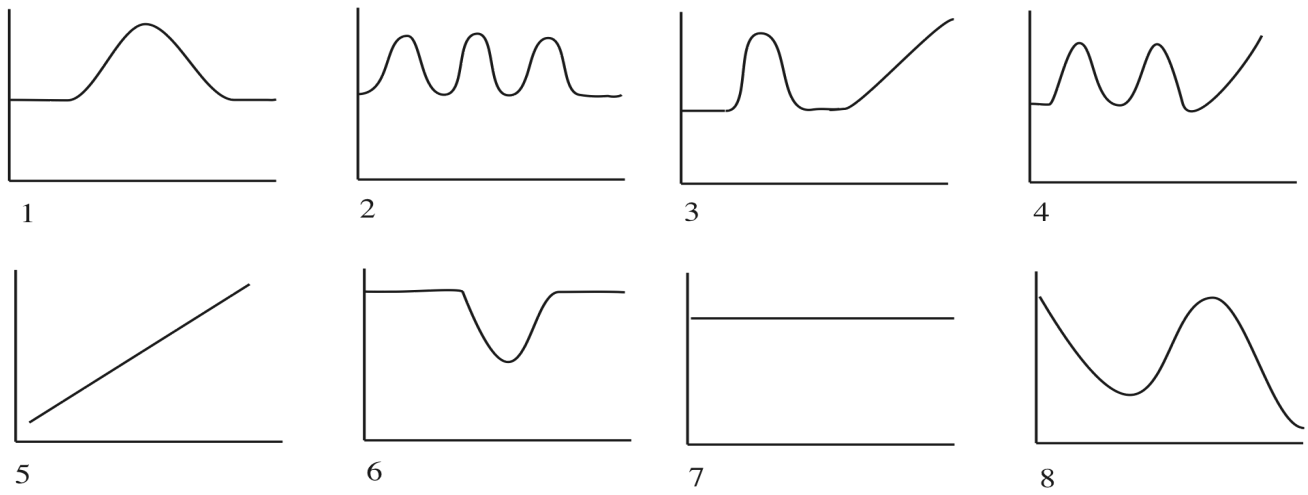

Figure 3.
Prototypes of immediate and delayed visually reported emotions The y-axis shows the intensity of the emotions, and the x-axis is the timeline of the episode.

A total of 86% (the sum for prototypes 1-4 in Figure 3) of the participants reported immediate peak pleasure, and over half of these (43%) reported one peak, and high levels of pleasure in the end of the episode (prototype 3). For immediate interest, 67% of the participants reported one or more peaks (prototypes 1-4). The large majority of these (53%) reported one peak, but low interest levels at the end of the episode (prototype 1). None of the participants reported cero immediate pleasure variance, and only 13% reported no immediate variance in interest (prototype 7).

The following day, only 37% reported one or more pleasure peaks (prototypes 1-4). And further, only 34% reported delayed interest peaks (prototype 1-4). Further, a large percentage of the participants reported no variance in delayed pleasure (28%) and interest (40%) as indicated by prototype 7.

Table 3
Prototype Score of Immediate and Delayed Visually Reported Emotions (in percent)

	Immediate		Delay	
Figure nr.	Pleasure	Interest	Pleasure	Interest
1 One peak, low end	31	53	21	17
2 Several peaks, low end	6	7	3	14
3 One peak, high end	43	7	10	3
4 Several peaks, high end	6	-	3	-
5 Low to high	-	-	17	6
6 High, one low point	13	20	14	14
7 Flat, no variation	-	13	28	40
8 High start, one low, one peak, low end	-	-	8	6
N	16	15	29	30

Note. Two independent raters rated the visualized emotional reports into the eight different prototypes. The inter rater reliability was 85%.

Different expressions of emotions

Verbally vs. Visually Reported Emotions. The verbal reported emotions showed no significant correlations with the visually reported emotions when assessed immediately after the episode. Yet, after a 24 hours delay the verbally reported emotions correlated

significantly with some of the visually reported variables for pleasantness (4 significant correlations) and interest (2 significant correlations). Please cf. Table 4 for further details.

Table 4
Pearson's Product-Moment Correlations Between Feelometer Variables Measuring Pleasure and Interest and Verbally Reported Pleasure and Interest.

	Immediate		Delay	
	Pleasure	Interest	Pleasure	Interest
Height of starting point	-.16	-.14	.40*	.33
Number of peaks	.08	-.25	.00	.03
Height of end point	.35	.08	.42*	.05
Height of highest point	.08	.33	.55**	.55**
Height of highest point that is not start or end	-.16	.21	.54**	.60**
Height of lowest point	-.29	.03	.33	.16

Note. ** = P < .01. N = 14 (Immediate) and 20 (Delay).

Heart Rate. Table 5 shows the correlations between minimum, average and maximum heart rate recorded during the actual jump (HRJ), and later, when the participants were primed, viewing film of themselves jumping (HRF).

The average HRJ correlated significantly with the minimum HRJ ($r = .91$, $p < .001$). But the maximum HRJ did not correlate significantly with either average HR ($r = .24$, $p = .228$) or minimum HRJ ($r = .15$, $p = .445$). A closer inspection of the HRJ and altitude measured revealed that all participants, with no exceptions, reached maximum HRJ at the point of exit, or immediately after. Further, none of the HR measures recorded during the jump correlated with HR recorded during the priming with film.

In the film condition all three variable correlated significantly with each other, respectively; minimum and maximum HR ($r = .85$, $p < .001$), minimum and average HR ($r = .97$, $p < .001$) and finally average and maximum HR ($r = .93$, $p < .001$).

In sum this shows that the arousal level is significantly lower in the delayed condition compared to the actual jump. Further it shows that arousal during the actual jump is more varied with a more distinct peak, compared to the delayed measure.

Table 5
Pearson's Product-Moment Correlations, Means and Standard Deviations (SD) for Heart Rate During the Jump and During the Film.

		During Jump			During Film		
	Variables	1	2	3	4	5	6
During Jump	1 Minimum	1.00					
	2 Average	.91***	1.00				
	3 Maximum	.15	.24	1.00			
During Film	4 Minimum	.16	.16	.24	1.00		
	5 Average	.09	.12	.27	.97***	1.00	
	6 Maximum	.00	.06	.26	.85***	.93***	1.00
	Mean	114.30	141.60	159.90	68.04	73.52	80.38
	SD	15.16	16.39	37.32	10.44	9.94	10.10

*Note.*** = p ≤ .001. All means are significantly different from one another (p < .001, except between Jump Average and Jump Maximum, for which the difference was significant at p = .004). N = 24.

Heart rate and verbally reported emotions. As shown in Table 6, the maximum heart rate (HRJ) predicted reported engagement (r = .48, p = .019). It is also worth noticing that the minimum (HRJ) correlated parasignificantly with fear (r = .38, p = .063).. The maximum heart rate during the film (HRF) tended to correlate with both pleasantness (r = .41, p = .085) and engagement (r = .40, p = .088). Higher skills predicted both higher minimum HRF (r = .46, p = .039), average HRF (r = .48, p = .031) and maximum HRF (r = .47, p = .037).

Table 6
Correlations Between Heart Rate During the Jump and Film, and Verbally Reported Emotions and Skills After a 24 Hours Delay.

		Heart Rate Jump			Heart Rate Film		
Variables		Min.	Mean	Max.	Min.	Mean	Max.
Verbally reported Emotions	Pleasure	-	-	-	-	-	.41
	Engagement	-	-	.48*	-	-	.40
	Anger	-	-	-	-	-	-
	Fear	.38	-	-	-	-	-
	Sadness	-	-	-	-	-	-
Skills		-	-	-	.46*	.48*	.47*

Note. Only correlations with p-values below .10 are shown. * = p < .05. N = 24.

Well-being indicators and Personality traits

Describing the Variables

Table 7 shows that life satisfaction correlates significantly with pleasure ($r = .52$, $p = .004$), but not with engagement ($r = .11$, $p = .556$). Engagement correlates strongly with extraversion ($r = .79$, $p < .001$) and agreeableness ($r = .57$, $p \leq .001$). Extraversion and agreeableness also correlates significantly ($r = .56$, $p \leq .001$). Individuals with high levels of life satisfaction and conscientiousness experience fewer negative emotions, respectively ($r = -.61$, $p < .001$) and ($r = -.45$, $p = .013$). Personal growth correlates with openness to experience ($r = .56$, $p \leq .001$).

Table 7
Pearson's Product-Moment Correlations, Means and Standard Deviations (SD) for the Background Variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Pleasure (trait)	1.00									
2. Engagement (trait)	.39*	1.00								
3. Negative emotions (trait)	-.34	.00	1.00							
4. Personal Growth	-.17	.29	-.17	1.00						
5. Life Satisfaction	.52**	.11	-.61***	.26	1.00					
6. Extraversion	.22	.79***	.06	.19	.04	1.00				
7. Neuroticism	-.32	-.11	.36	.15	-.15	-.06	1.00			
8. Openness to experience	-.09	.35	-.29	.63**	.11	.21	-.03	1.00		
9. Agreeableness	.29	.57**	-.11	.14	.06	.56**	.01	.30	1.00	
10. Conscientiousness	.26	.03	-.45*	-.14	.46*	-.01	.01	-.07	.10	1.00
Mean	5.62	5.52	2.92	4.02	5.44	3.41	2.18	3.94	4.10	3.27
SD	0.67	0.87	1.00	0.60	0.73	0.74	0.70	0.56	0.66	0.82

Note. * = p < .05; ** = p < .01; *** = p < .001; N = 29.

Predicting Extreme Sport Emotions

Well-being indicators. Table 8 shows the relationship between well-being, personality traits and the delayed reported state emotions. In addition the table shows the relationships between the personality traits and heart rate during the jump (HRJ) and film (HRF). Only correlations with p ≤.10 are shown.

Table 8
Pearson's Product-Moment Correlations Between Background Variables and Heart Rate Measures During the Jump and Film, and Emotions Immediate (in parentheses) and Delayed.

		Well-being measures					Personality measures				
		Pleas	Eng	Neg	PG	SWLS	Extra	Nevro	Open	Agree	Cons
	V1 Height of starting point	-	.44*	-	-	-	.41*	-	-	.45*	.34
	V2 Number of peaks	-.42*	-	-	-	-	-	-	-	-	-
Visual	V3 Height of end point	-	-	-	-	-	-	-	(.52)	.40*	-
reports -	V4 Height of highest point	-	.39	-	-	-	-	-	-	.48*	-
Pleasure	V5 Height of highest point that	(.81**)		(-.81**)		(.67*)		(-.78**)			
	is not start or end	.41*	.36		-		-		-	-	-
	V6 Height of lowest point	-	.40*	-	-	-	-	-	-	-	.43*
	V1 Height of starting point	.56**	-	-	- .43*	(.64*) .45*	-	-	-38	-	.56*
Visual	V2 Number of peaks	-.56**	-	-	-	-.35	-	-	-	-.36	(.53)
reports –	V3 Height of end point	-	-	-	-	-	-	-	(.64*)	.37	-
Interest	V4 Height of highest point	-	-	-	-	-	-	.36	(.53)	(.70*) .56**	-
	V5 Height of highest point that										
	is not start or end	-	-	-	-	-	-	-	-	-	-
	V6 Height of lowest point	.56**	-	-	-.36	-	-	-	(-.68*)	-	.39
Verbal	Pleasant	-	-	.36	-	-	.37	(-.64*)	-	.48*	-
Reports	Engagement	-	.48*	-	-	-	.38	(-.63*)	-	.36	-
	Anger	-	-	.35	-	-.38	-	-	-	-	(-.63*) -.61***
	Fear	-	-	-	-	-.41*	-	-	-	-	-
	Sadness	-.35	-	-	-	-	-	-	-	-	-
	Minimum	-	-	-	-	-	-	.60**	-	-	-
HR Film	Average	-	-	-	-	-	-	.62**	.40	-	-
	Maximum	-	-	-	-	-	-	.49*	-	-	-
HR Jump	Maximum	-	-	-	-	-	-	-	.58**	-	-

Note. Only correlations with p-values below .10 are shown. * = p ≤ .05.**; = p < .01; *** = p < .001.
N = 12 for Immediate and N = 20 – 24 for Delayed.

Not surprising, trait pleasantness was a fair predictor of visually reported pleasantness. Compared with those low on trait pleasantness, participants with high trait pleasantness scores reported few delayed pleasantness peaks in the Feelometer (r = -.42, p = .035). Further, they also reported high values of both immediate and delayed pleasantness in the middle of the episode, (V5 immediate: r =.81, p = .002; and V5 delay: r = 41, p = .041). High levels of pleasure in the middle of the episode was also predicted by negative trait emotions (V5 immediate: r = -.81, p = .002) and satisfaction with life (V5 immediate: r = .67, p = .018).

Trait pleasantness also turned out to be a fairly good predictor of delayed visually reported interest, predicting high initial interest (V1 delay: r = .56, p = .003), high minimum

interest (V6 delay: $r = .56$, $p = .004$) and low variation of experienced interest during the episode (V2 delay: $r = -.56$, $p = .004$).

Trait engagement predicted visual reported pleasantness. Compared to those low on trait engagement, participants with high trait engagement scores, experienced high initial pleasantness (V1 delay: $r = .44$, $p = .030$) and high minimum of pleasure (V6 delay: $r = .40$, $p = .049$). Further trait engagement showed para-significant correlations with maximum pleasure (V4 delay: $r = .39$, $p = .055$) and (V5 delay: $r = .36$, $p = .076$).

More surprisingly, trait engagement did not predict visually reported interest at all. We would also expect trait engagement to somewhat co vary with personal growth, but here we see the opposite tendency.

Personal growth was, as expected, a fair predictor for visual reported interest, but did not predict visual reported pleasure. Participants with high personal growth scores, experienced low initial interest (V1 delay: $r = .43$, $p = .034$), and low minimum of interest during the episode (V6 delay: $r = -.36$, $p = .081$).

In sum, the background variables for well-being were not consistent predictors of delayed visually reported emotions.

Personality traits. When it comes to personality measures, neuroticism was also a good predictor for immediate visually reported pleasantness (*V5 immediate:* r = .78, p = .003). Agreeableness turned out to be a good predictor for delayed visually reported pleasure (*V1 delay:* r = .45, p = .025), high maximum of pleasure (*V4 delay:* r = .48, p = .025) and high pleasure in the end of the episode (*V3 delay:* r = .40, p = .048). Agreeableness also predicted visually reported interest (*V3 delay:* r = .56, p = .003) and (*V3 delay:* r = .40, p = .048), less number of interest peaks (*V2 delay:* r = -.36, p = .077) and high interest at the end of the episode (*V3 delay:* r = .37, p = .070).

Further, it is worth to notice that extraversion predicted high level of initial pleasure (V1 delay: $r = .41$, $p = .044$). Conscientiousness turned out to be a good predictor for initial interest (V1 delay: $r = .34$, $p = .094$) and low levels of both immediate anger ($r = 63$, $p = .029$) and delayed anger ($r = 61$, $p < .001$).

When it come to heart rate, neuroticism was a good predictor during the film; minimum HR ($r = .60$, $p = .005$), average HR ($r = .62$, $p = .004$) and maximum HR ($r = .49$, $p = .029$). Openness predicted maximum heart rate during the jump ($r = .56$, $p = .009$).

Discussion

This study explored ways of measuring emotions during extreme sport. The results showed no sign of repeated assessment biases, but did reveal substantial retrospective biases. We also found huge discrepancies between different expressions of emotions, illustrated with low correlations between the verbal, the visual and the physiological assessments. The study further revealed vast variations among negative emotions. This result suggests that the widespread practice of collapsing feelings such as fear, sadness and anger into one, overarching concept of negative emotion does not make sense for extreme sport experiences. Personality traits predicted some of the emotion measures in the current study. For example, neuroticism predicted heart rate for participants when they were watching themselves on film (i.e., after a 24 hours delay), whereas openness was the only trait capable of prediciting heart rate during the jump.

Extreme sport experiences seem difficult to capture using traditional Likert-like scales. Further, the pattern of experiences cannot be predicted in the same manner as other episodes (cf. the peak-end rule as described in Kahneman, 1999). In retrospect the verbalized experiences are reported somewhat more similar to what we would expect to find in less extreme situations. However, the negative emotions unfolded to a degree at which it became problematic to treat them as a single category. For example, when recalled the next day, fear seemed to be underreported and was uncorrelated with the immediate measure taken the previous day. Anger, on the other hand, was very stable over the two measures, both with respect to mean levels, and, in particular, with regard to the retest correlation. Sadness, differed from both fear and anger. Remarkably, sadness was totally absent immediately after the jump, but appeared in the reports given the following day.

In retrospect the visualized emotions, especially pleasure, loose some of their variations. Further, pleasure seems less stable than interest.

Verbalized (mean/totality) and visualized (moment-to-moment) emotions give quite different results immediately after the jump. Neither immediate peak, nor end ratings seem to predict verbally reported emotion. This is also the case for delayed interest. The peak-end rule does, however, apply to delayed pleasure. But for immediate pleasure, the initial reported emotions seem to be a better predictor for the verbal reported emotions.

Maximum heart rate during the jump does not correlate with either minimum or average. For the delayed heart rate minimum, average and maximum are highly correlated. None of the heart rate measures during the jump correlated with delayed heart rate. Trait engagement predicts maximum heart rate during the jump, whereas the level of skills predicts delayed heart rate.

Several background variables predict highest point for the visually reported immediate emotions. Personality variables are a better predictor for immediate emotions than subjective well-being variables. Neuroticism predicts delayed heart rate, whereas openness predicts maximum heart rate during the jump.

Kahneman and his colleagues (2004) argue that people are able to give an accurate picture of experiences during a short episode, and not only a momentarily emotional report. However, in immediate reports of extreme sport experiences, this does not seem to be the case. In the verbally reported emotions, which cover the episode in total, we see extreme means scores (very high, low or absent). The scales alpha value also show that the items does not co vary like we would expect in other less extreme episodes, and thus that the emotions does not group together like they normally do. Instead of experiencing a range of emotions, it looks more like some emotions stand out, while others, like sadness, totally disappear. This may leave the participants experiencing fewer, but stronger and more clearly defined emotions.

If we look at the immediate visualized emotions we see that there is a great variation during the episode, especially for pleasure. This may also make it difficult for the participants to rate their overall experienced pleasure during the episode on a Likert-like scale. The fact that none of the six measuring points for immediate visualized pleasure correlated with the immediate verbally reported pleasure somewhat confirms this.

In retrospect, the pattern of reported emotions is more like what we would expect to find in less extreme situations. And, in line with Robinson and Clore (2002a), when asked to visualize their remembered pleasure, the participants report a less varied emotion with fewer peaks, higher lows and lower highs. We also see that a small amount of sadness is reported, and fear is repressed in favor of pleasure.

There is also some evidence suggesting a negative correlation between arousal and pleasure. The participants report low levels of initial immediate pleasure (typically before the jump). An inspection of the heart rate data showed that the participants, without exceptions, reached maximum heart rate at the point of exit or immediately after they had stepped of the cliff or air plain. We also know from previous studies that high levels of arousal are associated with feelings of unpleasantness (Thayer, 1989; Willig, 2008). But during the jump the participants experience both high levels and pleasure peaks. After landing they still report high levels of pleasure.

Is emotions best measured immediately after the jump or after a 24 hours delay? An alternative, but not mutually exclusive explanation for the low reliability of the verbally reported immediate emotions is the high level of arousal. High arousal has been reported to cause an immediate memory deficit, lasting up to 30 minutes after the experience (Revelle & Loftus, 1992). In this study all participants were assessed within this time frame. Given this difficulty in retrieving information immediately after a high arousal experience, one should believe that assessments are better administered some time after the episode. The fact that

high arousal actually improve the encoding into the long term memory is even another argument to post pone the assessment.

On the other hand Robinson and Clore (2002a) show in several studies that the contextual details, which aids the reconstruction of emotional experiences, decrease with the passage of time, and therefore impoverish the emotional recall. In this study we have used film to aid the reconstruction of emotions, but still there is significant differences in the report given immediately after the jump, compared with the following day.

So, we see that even when primed by film, the emotions are affected by retrospective biases like the peak/end rule. Further, we also see less variation in the delayed emotions. On the other hand, the immediate memory deficit caused by high arousal may impair the report immediately after. In sum, time of assessment seems to be a trade off between reliability and retrospective biases.

Will this overestimation of pleasure lead the participants to repeat the event? Wirtz, Kruger, Scollon, and Diener (2003) found that expectations had a direct influence on the way an episode was remembered. People that think in advance they will have a great experience, remember the experience more favorably. This study shows that remembering the experience as pleasurable is predicted by general engagement. In other words, people who are generally engaged and interested appear to remember the extreme sport experience as more pleasurable than less engaged and interested individuals.

However, the experience itself may differ greatly from the way it is remembered. Wirtz and colleges (2003) further found that the remembered experience is the best predictor for the desire to repeat the event. The current study shows that when thinking back on an extreme sport experience, participants tend to overestimate their experience of pleasure, and repress their experience of fear.

Limitations

The present study had a relatively low number of participants (N = 31). We wanted the two groups of participants (skydivers and BASE jumpers) to be fairly equal. Thirteen of the participants are BASE jumpers, but given that there are only about 70 BASE jumpers in Norway, getting a significantly bigger sample was not possible within the realistic time frame of this study. This also implies that the sample analyzed in this study is taken from a very limited group of people, and care must be taken before generalizing to broader populations.

We used data obtained from questionnaires, with the limitations inherent to this method, and further there was no control group in this study.

The heart rate is affected of a range of different factors, which we have had no possibility to control. For example heart rate may be seen as an indicator of the physical shape of the participants. The heart rate for a person in good physical shape would drop quite fast when he or she stop being physically active. Further, for a person with a lower level of fitness the hike to the exit point will take more time, leaving the more fit participants resting for a longer time before the jump.

Future research

Future research should re-examine some of the results reported in this thesis. For example, the nature of negative emotions in extreme sport situations deserves additional attention, preferably with a larger sample. Moreover, the difference between visual moment-to-moment reports and the verbally reported episode experiences needs to be further analyzed with an emphasis on the high arousal nature of extreme sport.

Conclusion

In this study we have seen that extreme sport experiences are not easily captured by traditional Likert-like scales. When given immediately after the jump, such scales have low reliability and reveals an emotional profile that differs considerably from the visually reported experiences. Compared with episodes of everyday life, extreme sport seems to produce stronger and more heterogenous emotions, particularly with regard to the negative emotions. We have also seen that emotions are reported differently immediately after the jump, compared to the following day. The retrospective extreme sport emotions resemble experiences normally reported in everyday episodes, whereas the on-line reported emotions do not. A better understanding of the idiosyncrasies of momentary feelings of extreme sport may enhance our knowledge of both emotional experiences in general, and extreme sport experiences in particular.

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Appendix

A
Questionnaire about experiences

READ THIS FIRST
The questions in this survey concern satisfaction,
emotions and personality traits.
We kindly ask you to read the questions carefully,
and answer as precisely as you can.

I. SATISFACTION WITH LIFE

Below you will find five statements that you may agree or disagree with. Using the 1 - 7 scale below, please indicate in what degree you agree with each statement. Please be open and honest in your responding.

	Strongly Disagree						Strongly Agree
1. In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2. The conditions of my life are excellent.	1	2	3	4	5	6	7
3. I am satisfied with my life.	1	2	3	4	5	6	7
4. So far I have gotten the things I want in life.	1	2	3	4	5	6	7
5. If I could live my life over, I would almost not change anything.	1	2	3	4	5	6	7

II. EMOTIONS

In general, how often do you experience each of the emotions listed below?
Draw a circle around the number that best suits the strength for each of the 18 emotions.

Normally I feel:	Never						Always
1. Pleased	1	2	3	4	5	6	7
2. Satisfied	1	2	3	4	5	6	7
3. Happy	1	2	3	4	5	6	7
4. Angry	1	2	3	4	5	6	7
5. Frustrated	1	2	3	4	5	6	7
6. Annoyed	1	2	3	4	5	6	7
7. Enthusiastic	1	2	3	4	5	6	7
8. Engaged	1	2	3	4	5	6	7
9. Inspired	1	2	3	4	5	6	7
10. Fearful	1	2	3	4	5	6	7
11. Afraid	1	2	3	4	5	6	7
12. Nervous	1	2	3	4	5	6	7
13. Intensely engrossed	1	2	3	4	5	6	7
14. Intensely concentrated	1	2	3	4	5	6	7
15. Intensely interested	1	2	3	4	5	6	7
16. Sad	1	2	3	4	5	6	7
17. Blue	1	2	3	4	5	6	7
18. Depressed	1	2	3	4	5	6	7

III. SELF ASSESMENT

Below you will find a few statements that fit more or less for different people. Your task is to draw a circle around the number that fits you the best, LIKE YOU USUALY ARE. (Remember to answer all 18 items)

	Totally disagree				Totally agree
1. I enjoy tackling problems that are completely new to me	1	2	3	4	5
2. I enjoy trying to solve complex problems	1	2	3	4	5
3. The more difficult the problem, the more I enjoy trying to solve it	1	2	3	4	5
4. I want my work to provide me with opportunities for increasing my knowledge and skills	1	2	3	4	5
5. Curiosity is the driving force behind much of what I do	1	2	3	4	5
6. When I participate in an activity, I tend to get so involved that I lose track of time.	1	2	3	4	5
7. When I am actively interested in something, it takes a great deal to interrupt me.	1	2	3	4	5
8. My friends would describe me as someone who is "extremely intense" when in the middle of doing something	1	2	3	4	5
9. I believe in the importance of art	1	2	3	4	5
10. I love to think of new ways of doing things	1	2	3	4	5
11. I enjoy hearing of new ideas	1	2	3	4	5
12. I can carry the conversation to a higher level	1	2	3	4	5
13. I prefer variety to routine	1	2	3	4	5
14. I like to solve complex problems	1	2	3	4	5
15. I feel up to any task	1	2	3	4	5
16. I can perform a variety of tasks	1	2	3	4	5
17. I gladly accept challenges	1	2	3	4	5
18. I know how to apply my knowledge	1	2	3	4	5

IV. SELF-DESCRIPTION

In the following table you will find phrases that describe human behaviour. Please use the rating scale below to describe how accurately each statement describes *you*. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, compared to other people you know of the same sex as yourself and roughly the same age. Please read each statement carefully, and then fill in the bubble that corresponds best to where you see yourself on the scale.

	Very Inaccurate				Very accurate
1. Am the life of the party	1	2	3	4	5
2. Sympathize with the way other people feel	1	2	3	4	5
3. Get chores done right away	1	2	3	4	5
4. Have frequent mood swings	1	2	3	4	5
5. Have a vivid imagination	1	2	3	4	5
6. Don't talk a lot	1	2	3	4	5
7. Am not interested in other people's problems	1	2	3	4	5
8. Often forget to put things back in their proper place	1	2	3	4	5
9. Am relaxed most of the time	1	2	3	4	5
10. Am not interested in abstract ideas	1	2	3	4	5
11. Talk to a lot of different people at parties	1	2	3	4	5
12. Feel other people's emotions	1	2	3	4	5
13. Like order	1	2	3	4	5
14. Easily get upset	1	2	3	4	5
15. Have difficulty understanding abstract ideas	1	2	3	4	5
16. Keep in the background	1	2	3	4	5
17. Am not really interested in other	1	2	3	4	5
18. Make a mess of things	1	2	3	4	5
19. Seldom feel blue	1	2	3	4	5
20. Do not have a good imagination	1	2	3	4	5

V. EVALUATION OF LEIASURE ACTIVITIES

Below you will find a few statements about the leisure activity you like the most. Draw a circle around the number that best describe you relation to this activity. (Remember to answer all questions)

	Totally disagree				Totally agree
1. This activity allows me to live a variety of experiences.	1	2	3	4	5
2. The new things that I discover with this activity allow me to appreciate it even more.	1	2	3	4	5
3. This activity allows me to live memorable experiences	1	2	3	4	5
4. This activity reflects the qualities I like about myself	1	2	3	4	5
5. This activity is in harmony with the other activities in my life.	1	2	3	4	5
6. For me it is a passion, that I still manage to control	1	2	3	4	5
7. I am completely taken with this activity	1	2	3	4	5
8. I cannot live without it.	1	2	3	4	5
9. The urge is so strong. I can't help myself from doing this activity.	1	2	3	4	5
10. I have difficulty imagining my life without this activity.	1	2	3	4	5
11. I am emotionally dependent on this activity.	1	2	3	4	5
12 I have a tough time controlling my need to do this	1	2	3	4	5
13. I have almost an obsessive feeling for this activity.	1	2	3	4	5
14. My mood depends on me being able to do this activity.	1	2	3	4	5

VI. A SMALL PROBLEM SOLVING TASK

This task is about making meaningful words out of randomly presented letters. Below you will find three columns with letters. Each column has two rows, and for every row you shall put the letters together so they form a meaningful word. In total you shall make 2 words. But first you have to choose witch column to work with, and you are not going to work with the other columns. The first column has three letters, the second column has five letters and the third column has eight letters. On top of each column you will find an example showing how the letters can form a meaningful word.

Witch column do you want to work with? Put only one mark.

I choose to work with:

1 ☐ Column A (3 letters)

2 ☐ Column B (5 letters)

3 ☐ Column C (8 letters)

	A		B		C	
Example:	*UTP*	*Put*	ETLAB	*Table*	OWOAFTRE	*Footwear*
	PPU		CTHAY		DRAEDETR	
	ESE		RPEPA		EIMDICEN	

VII. EMOTIONS HER AND NOW

How did you experience this task? We will ask you to report what you feel right now. Focus on your self and how you feel, and draw a circle around the number that best describes you emotions right now. (one circle for each emotion)

Right now I feel:	Not at all						Very much
1. Satisfaction	1	2	3	4	5	6	7
2. Pleasure	1	2	3	4	5	6	7
3. Happiness	1	2	3	4	5	6	7
4. Fear	1	2	3	4	5	6	7
5. Anger	1	2	3	4	5	6	7
6. Sadness	1	2	3	4	5	6	7
7. Engagement	1	2	3	4	5	6	7
8. Interest	1	2	3	4	5	6	7
9. Enthusiasm	1	2	3	4	5	6	7
10. Or maybe another feeling?: (Fill in):_____	1	2	3	4	5	6	7

VIII. FINALLY

1) Gender (please put a x) [1] ☐ Female [2] ☐ Male

2) How old are you? (fill in) _____years

3) To be able to link the questionnaires together with the other ones you are going to fill out we need you to make a code.
Write the first two letters of you mothers name and you height in cm.
Example: Mothers name: Johanne. Height 179cm = ID:JO179

ID:_____

Thank you very much! Please put the questionnaire in the envelope and give it to the researcher in charge.

B
Questionaire about experiences

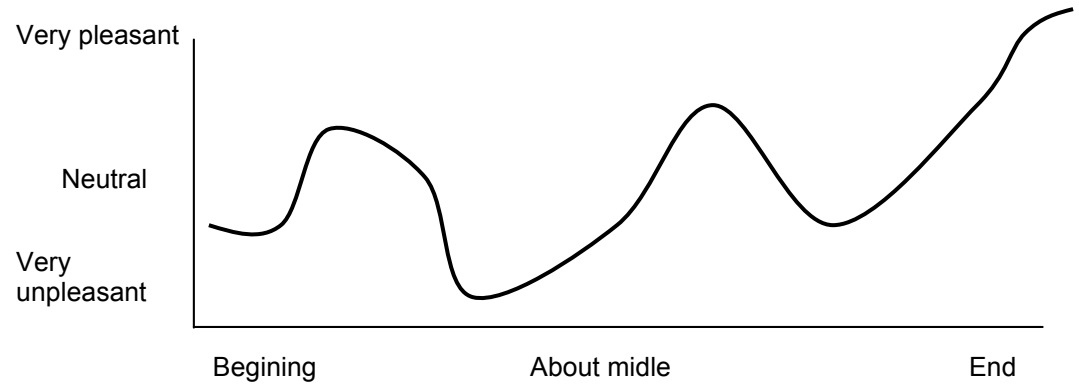
The aim of this questionaire is to summon up how you experienced a spesific situation/episode, which you recently have been through. In your case a base-jump. You have been filmed during this situation, and will now be asked how to recollect how you felt. Please describe your experiensces throughout the episode by answering this questionaire.

I. EMOTIONS DURING THE EPISODE ("FEELOMETER")

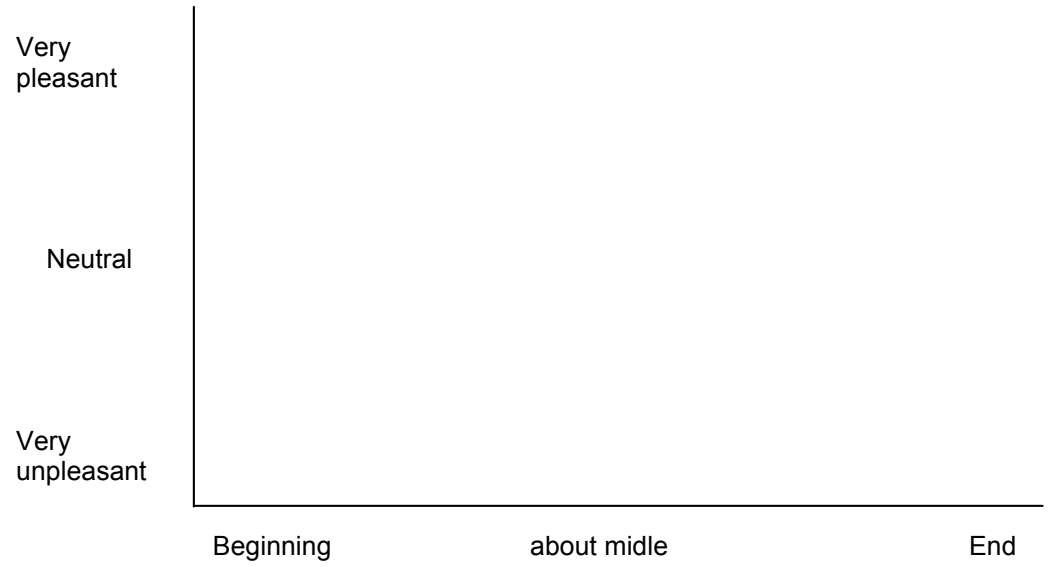
a. Below you will find a diagram with a time axe (horizontal line) and a "feelometer" (vertical line). On the feelometer we want you to state how **pleasant** or **unpleasant** your experiences were during the episode, from the beginning to the end. Please illustrate this by drawing a line that starts where we started the filming, and ends when the activity was over (About 2 minutes after you landed). We want the line to illustrate if your feelings were pleasant (high up on the vertical scale) or unpleasant (low on the vertical scale).

We would also like you to mark with a cross (X) the point on the line where you jump of the cliff, and another cross at the point where you land.

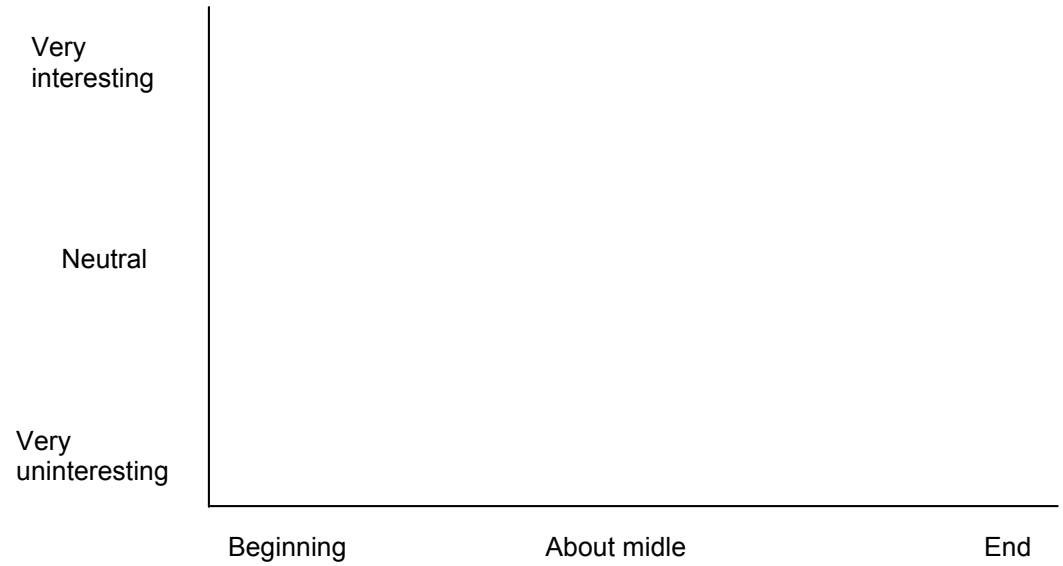
Here is an example:



Now it's your turn. How pleasant or unpleasant were your experiences during the episode?



b. We want you to do the same, but this time we want you to state how **interesting** or **uninteresting** you experienced the episode.
Again we would like you too mark with a cross (X) the point on the line where you jump of the cliff, and another cross at the point where you land.
Below you will find a new diagram with a time axis and a feelometer. The line we want you to draw shall now show how interesting (high on the vertical scale) or uninteresting (low on the vertical scale) you experienced the different sequences during this episode.



II. EMOTIOS DURING THE EPISODE

Now, let us look at your total impression of the episode. There are a number of emotions you may have experienced to a varying extent.

Try to recall how you felt during the episode, and draw a circle around the number that best describes you emotions (One circle for every emotion):

During the episode I felt:	Not at all						Very true
1. Satisfied	1	2	3	4	5	6	7
2. Pleasure	1	2	3	4	5	6	7
3. Happiness	1	2	3	4	5	6	7
4. Fear	1	2	3	4	5	6	7
5. Anger	1	2	3	4	5	6	7
6. Sadness	1	2	3	4	5	6	7
7. Commitment/Engagement	1	2	3	4	5	6	7
8. Interest	1	2	3	4	5	6	7
9. Enthusiasm	1	2	3	4	5	6	7
10.Or maybe some other dominant feeling?							
(Fill in):_____	1	2	3	4	5	6	7

III. HOW YOU EXPERIENCED THE SITUATION

Below we have coupled some words that describe opposite feelings. Between these words is a scale from 1 to 7. Your task is to decide how precisely these words describe your experience of the situation you have been through, by locating this on the scale. For every pair of words you must draw a circle around the number that most adequately matches your experience of the situation.

1. Uninteresting	1	2	3	4	5	6	7	Interesting
2. Unpleasant	1	2	3	4	5	6	7	Pleasant
3. Difficult	1	2	3	4	5	6	7	Easy
4. Challenging	1	2	3	4	5	6	7	Tame
5. Dramatic	1	2	3	4	5	6	7	Undramatic
6. Frustrating	1	2	3	4	5	6	7	Not frustrating

IV. YOUR SKILLS

Please draw a circle around the number that most accurately describes how you judged your skills to be during this situation.

In this situation my skills were:

Not good enough	1	2	3	4	5	6	7	Very good

V. MASTERING How did you cope with this situation?

Not very good	1	2	3	4	5	6	7	Very good

VI. FEELING OF FREEDOM How strong was your feeling of freedom during this episode?

Very low feeling of freedom	1	2	3	4	5	6	7	Extremly high feeling of freedom

VII. DECRIBING EXPERIENCES

Please indicate to witch degree the statements below match your experiences in this episode or situation. (One ring for each of the three descriptions)

1. My mind was not wandering. I was not thinking of anything else. I was totally involved in what I am doing.

Not at all 1 2 3 4 5 6 7 *Totally right*

2. To concentrate was like breathing -I never thought of it. I was less focused on myself and my problems. I was in fact oblivious to my surroundings.

Not at all 1 2 3 4 5 6 7 *Totally right*

3. It seemed like the time stood still. I was so involved in what I was doing that I became a part of it.

Not at all 1 2 3 4 5 6 7 *Totally right*

VIII. FINALY

1) Degree of experience with the activity that was filmed.
How experienced do you consider yourself to be with the activity that was filmed?

No experience	1	2	3	4	5	6	7	Very long experience

2) Gender (please put a x) [1] ☐ Female [2] ☐ Male

3) How old are you? (Fill in) _____years

4) To be able to link the questionnaires together with the one you have already completed, and the other one you are going to fill out we need you to make a code.

Write the first two letters of you mothers name and you height in cm.
Example: Mothers name: Johanne. Height 179cm = ID:JO179

ID:_____

We also need to write down the file number from the heart rate monitor so that we can match the heart rate data with the questioners. Please ask the researcher in charge to find the file number from your jump and write it down here

File number:_____

Thank you very much! Please put the questionaire in the envelope and give it to the researcher in charge.

C - 1
Questionnaire about experiences

This questionnaire is about your experiences of a specific episode, just like the last one you filled out. This time you will see five minutes of film, but first we kindly ask you to answer the questions on the first two pages.

I. EMOTIONS HER AND NOW

Focus on yourself and how you feel right now, and draw a circle around the number that best describes your emotions right now. (One circle for every emotion)

Right now I feel:	Not at all						Very true
1. Satisfied	1	2	3	4	5	6	7
2. Pleasure	1	2	3	4	5	6	7
3. Happiness	1	2	3	4	5	6	7
4. Fear	1	2	3	4	5	6	7
5. Anger	1	2	3	4	5	6	7
6. Sadness	1	2	3	4	5	6	7
7. Commitment/Engagement	1	2	3	4	5	6	7
8. Interest	1	2	3	4	5	6	7
9. Enthusiasm	1	2	3	4	5	6	7
10.Or maybe another dominant feeling?: (Fill in):_____	1	2	3	4	5	6	7

II. HOW YOU EXPERIENCED THE SITUATION

Below we have coupled some words that describe opposite feelings. Between these words is a scale from 1 to 7. Your task is to decide how precisely these words describe your experience of the situation you have been through, by locating this on the scale. For every pair of words you must draw a circle around the number that most adequately matches your experience of the situation.

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3. Difficult	1	2	3	4	5	6	7	Easy
4. Challenging	1	2	3	4	5	6	7	Tame
5. Dramatic	1	2	3	4	5	6	7	Not dramatic
6. Frustrating	1	2	3	4	5	6	7	Not frustrating

FILM

You will now see 5 minutes of the film that has been shot of you. After the film we will ask you about your emotions in the situation that is shown. We therefore ask you to try to recapture how you felt at the time you were filmed, and pay attention to the emotions that may come back to you while you watch the film.

Please tell the researcher in charge that you are ready to watch the film.

I. EMOTIONS DURING THE FILM ("FEELOMETER")

a. Below you will find a diagram with a time axe (horizontal line) and a "feelometer" (vertical line). On the feelometer we want you to state how **pleasant** or **unpleasant** your experiences were during the episode, from the beginning to the end. Please illustrate this by drawing a line that starts where we started the filming, and ends when the activity was over (About 2 minutes after you landed). We want the line to illustrate if your feelings were pleasant (high up on the vertical scale) or unpleasant (low on the vertical scale).

We would also like you to mark with a cross (X) the point on the line where you jump of the cliff, and another cross at the point where you land.

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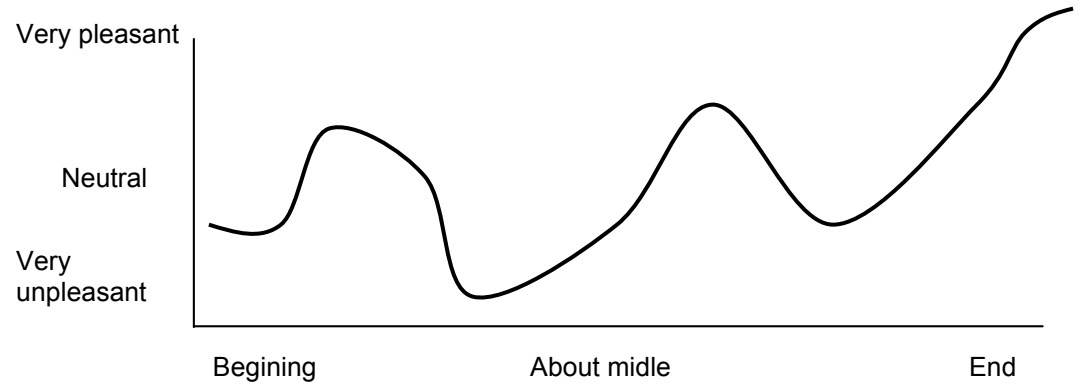
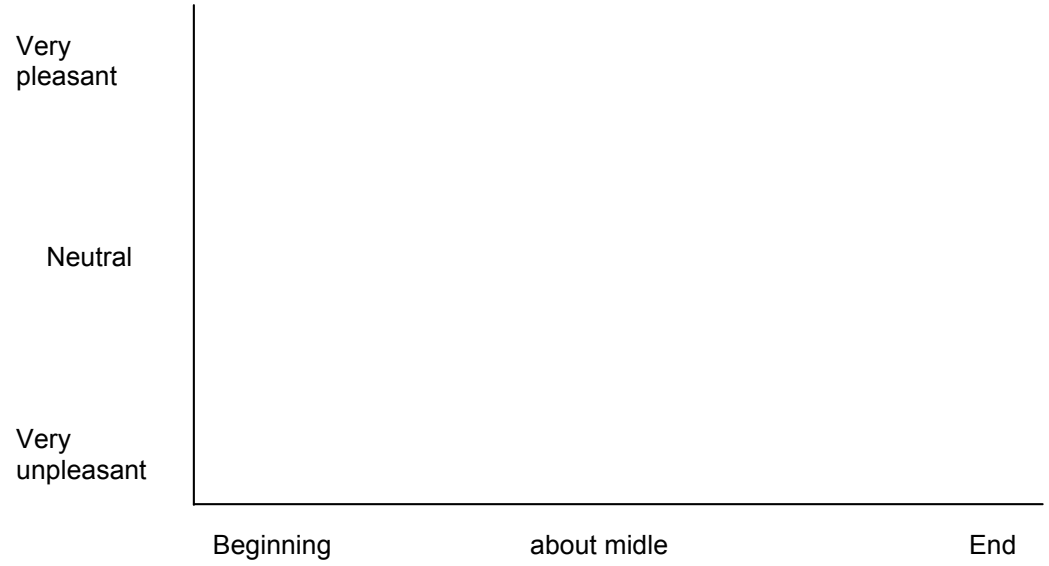


Now it's your turn. How pleasant or unpleasant were your experiences during the episode?



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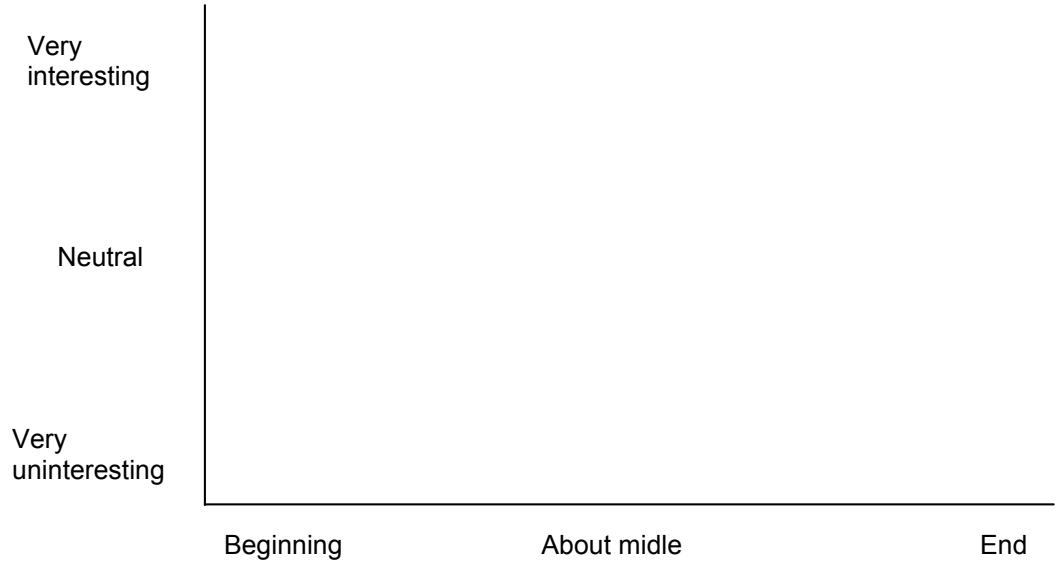

II EMOTIONS DURING THE FILM

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Try to recall how you felt during the episode, and draw a circle around the number that best describes you emotions (One circle for every emotion):

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6. Sadness	1	2	3	4	5	6	7
7. Commitment/Engagement	1	2	3	4	5	6	7
8. Interest	1	2	3	4	5	6	7
9. Enthusiasm	1	2	3	4	5	6	7
10.Or maybe some other dominant feeling?							
(Fill in):_____	1	2	3	4	5	6	7

III. EXPERIENCES OF THE SITUATION

Below we have coupled some words that describe opposite feelings. Between these words is a scale from 1 to 7. Your task is to decide how precisely these words describe your experience of the situation you have been through, by locating this on the scale. For every pair of words you must draw a circle around the number that most adequately matches your experience of the situation.

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Not at all 1 2 3 4 5 6 7 *Totally right*

3. It seemed like the time stood still. I was so involved in what I was doing that I became a part of it.

Not at all 1 2 3 4 5 6 7 *Totally right*

IIX. FINALY

1) Gender (please put a x) [1] ☐ Female [2] ☐ Male

2) How old are you? (fill in) _____years

3) How many days is it since you were filmed? _____days.

4) To be able to link the questionnaires together with the ones you have already completed, we need you to make a code.

Write the first two letters of you mothers name and you height in cm.
Example: Mothers name: Johanne. Height 179cm = ID:JO179

ID:_____

We also need to write down the file number from the heart rate monitor so that we can match the heart rate data with the jump. Please ask the researcher in charge to find the file number from your file number and write it down here

File number:_____

Thank you very much! Please put the questionnaire in the envelope and give it to the researcher in charge.