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An exploration of the emotional experience of BASE jumping

A thesis submitted in fulfilment of the requirements for the award of the degree:

Master of Psychology

from

Massey University

School of Psychology

by

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25th May 2017

Thesis Certification

I, Anton Green, declare that this thesis, which is submitted in fulfilment of the requirements for the award of a Master of Psychology, from the School of Psychology, Massey University, New Zealand, is my own work unless otherwise referenced or acknowledged. Additionally, this thesis has not been submitted for qualifications at another institution.

A handwritten signature in black ink, appearing to read 'Anton Green', enclosed within a hand-drawn oval shape.

Anton Wayne Green

25 May 2017

Abstract

BASE jumping is an extreme sport, where participants parachute from fixed objects and deploy a parachute to land safely. According to the current injury and fatality statistics, it is regarded as the most dangerous sport in the world. The level of danger suggests that participants have to negotiate strong emotional experiences in the sport. The aim of this study is to explore the emotions that BASE jumpers experience and determine what role and impact these emotions may play for participants. Twenty male BASE jumpers with at least 10 jumps and 3 months of participation in the sport were interviewed for the study. Qualitative (thematic) analysis was undertaken to analyse the BASE jumping experience. Participants reported intense emotional experiences that predominantly emerged as fear, flow and thrill states. A number of threats associated with these emotions were identified. The experience of fear may become normalised, whilst flow and thrill may lead to an escalation of risk taking in the pursuit of the rush experience. Conflicting feelings create emotional dissonance which also influences coping styles and rationalisation strategies. This may impact risk taking behaviour, judgement and decision making. Outcomes from the study may enhance greater knowledge of psychological processes that impact risk and safety behaviours in the sport.

Acknowledgements

I would like to take a moment to acknowledge a number of moments in my life's journey that has brought me to this point; and the people who have guided my research process. Without their contribution, this thesis would have never been completed.

I have always been fascinated with extreme sport. My journey into this world began as a young 17-year old crouched in the doorway of a small Cessna aircraft, preparing to do my first parachute jump. Throughout the years I have walked a number of extreme sport paths which have included skydiving, paragliding, climbing, mountain biking, white water kayaking and scuba diving. These have all been meaningful experiences, but none came close to my foray into the world of BASE jumping.

My time in BASE jumping was short lived, but through the guidance of Snake River BASE Academy I was able to fulfil one of my life's greatest ambitions - to learn to BASE jump. Even though I have not jumped for some time now, the experience was profound. I still think about the experience regularly, savouring the feeling of stepping off the bridge and committing myself to the void. The memories never fail to stir me. I was fascinated by the people I met whilst BASE jumping and was interested as to what drew them to the sport. This was the start of my curiosity into researching BASE jumping.

It is important to acknowledge that I came to this research with certain biases and preconceptions about BASE jumping from my time in the sport. Through the guidance of Dr Deborah Green, I have hopefully put aside these biases and opened my mind to what the experience of BASE jumping means for others in the sport. To those that guided my research process, Dr Dianne Gardner and Professor Stephen Legg, I would also like to say thank-you.

This research would not have been possible without the support of all the BASE jumpers that volunteered to be a part of this study. BASE jumping is a small and very closed community,

and one that does not easily open its doors to scrutiny. Your willingness to participate in my study is greatly appreciated.

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Definitions

Aerials:	Gymnastic manoeuvres, such as forward and back loops, that BASE jumpers carry out in freefall.
BASE:	An extreme sport where participants use a parachute to descend from fixed objects.
BASE Fatality List:	A record of the BASE fatalities, since the first death in 1981, on www.blincmagazine.com .
Exit point:	The point on a fixed object from which participants start the jump.
Gear fear:	Anxiety about not packing correctly and that the parachute may malfunction on opening.
Object strike:	A 180-degree parachute opening resulting in the jumper striking a fixed object.
Pilot-chute:	A small parachute that is thrown out into the slipstream that pulls out and deploys the main parachute. Pilot-chutes have replaced old style rip-chord handles.
Tracking:	A freefall body position that allows BASE jumpers to fly horizontally away from a fixed object while in freefall.
Wingsuiting:	A garment of clothing worn by BASE jumpers, that makes them resemble a 'flying squirrel'. It inflates with air in freefall and allows them to fly horizontally away from fixed objects.

Introduction

The jumper planned to wingsuit BASE jump a very technical site with a ledge 50 metres below the exit point that he needed to clear. He was made aware of the difficulty of the jump but felt confident in his motivation to jump this site. He also had a lot of experience on the wingsuit model he was using on this jump. The jumper struggled on the hike up to the exit, turning a three-hour hike into a five-hour trip. At the exit point, clouds obscured the exit and the jumper waited another four hours for conditions to improve. When the visibility improved, there was a tailwind on exit, creating a slight downdraught. The jumper decided to jump, proclaiming “I’d rather jump than hike down”, due to being tired and it was getting late in the day. His partner elected to hike back down. The jumper had a poor exit, went partly unstable, and started flying too low on recovery. He impacted the ledge and died instantaneously (Blinc, 2017).

BASE jumping is an extreme sport where participants parachute from fixed objects. BASE is an acronym that describes the main forms of fixed objects from which participants jump: B = building, A = antennae, S = span (bridge) and E = earth (cliffs). It is regarded as the most dangerous sport in the world in terms of fatality statistics. Even though the equipment that participants use is technologically advanced, and BASE jumping schools offer extensive training courses, participants are still dying because it appears that they are making poor judgements about risk. This suggests that psychological factors may be playing a role in the chain of events that lead to an accident.¹

The extract from a BASE jumping fatality report shows a number of failings in judgement and decision making on the part of the deceased. Extensive research has shown how emotions play an important role in decision making and risk taking (Schwartz, 2000; Slovic, Finucane, Peters & MacGregor, 2004). This research explores the emotional experience of BASE jumping and looks to examine how these emotions may impact upon decision making, judgement and risk taking in the sport. To date, little is known about the psychological aspects that underlie risk taking and decision making in extreme sport, and particularly in

BASE jumping. This present study aims to address this gap in the knowledge, so as to provide BASE jumpers greater insight, knowledge and awareness of the psychological factors that underpin their sport. It is hoped that this knowledge will lead to a greater level of good decision making and safety in BASE jumping.

Chapter 1

Background to the research

1.1. Risk taking and extreme sport

Risk taking may be defined as: “a purposive participation in some form of behaviour that involves potential negative consequences or losses (social, monetary, interpersonal) as well as perceived positive consequences or gains” (Ben-Zur & Zeidner, 2009, p.110). Individuals react to risk at two levels: they evaluate risk cognitively, and react to it emotionally.

Loewenstein, Weber, Hsee and Welch (2001) found that emotional reactions to risk often deviate from cognitive assessments of risk, and that when this occurs, emotions often drive behaviour.

Cheron & Ritchie (1982), categorise risk into antisocial, pro-social and adventurous risk. Behaviours such as gambling and binge drinking are considered anti-social risk taking. Working as a firefighter or military combatant is pro-social risk taking. High risk sport or arctic exploration are examples of adventurous risk taking. Lyng (2005) conceptualises voluntary risk taking or ‘edgework’, as exploring the limits of ones’ ability, whilst remaining within control. The ‘edge’ is the boundary between chaos and order; the line between life and death. Voluntary risk takers ‘crowd the edge’ by coming as close as possible to ‘chaos’ without losing control. The ‘edge’ is continuously being challenged by the ‘edge-worker’; and each ‘edge-worker’ determines their own boundary and subjective perception of risk (Laurendeau, 2008).

High risk sport, termed extreme sport, is an ‘edgework’ activity and can be described as “all sports where you have to reckon with the possibility of serious injury or death as an inherent part of the activity” (Breivik, 1999, p.10). A key feature of extreme sport is that it is

associated with risk and danger, where a mistake may have tragic consequences. In terms of danger, extreme sports range on a continuum, from low risk sports such as skateboarding, to high risk sports such as BASE jumping.

The past two decades have seen exponential growth in extreme sport participation (Creyer, Ross & Evers, 2003; Pain & Pain, 2005), which has given rise to a number of theories about the motivations regarding attraction to extreme sport. According to Davidson (2008), risk is a culturally constructed phenomenon originating from societies' deep-rooted aversion to uncertainty. Within our modern society, risk aversion is seen as a rational behaviour, whilst risk taking is seen as resulting from a lack of knowledge or poor perception (Lupton & Tulloch, 2002). From an evolutionary perspective, modern lifestyles lack the risks and challenges that were faced by our ancestors. Hunter-gathers would have been faced with a high element of danger in their daily quest for survival. Breivik (2010) maintains that extreme sports participants may be searching for challenge and excitement, similar to that faced by these earlier ancestors. The struggle for survival may have forced our ancestors to become accustomed to high levels of danger and stimulation on a daily basis, and this is now what people seek to replicate in extreme sport. From a sociological viewpoint, Langseth (2011) believes that participation in extreme sport is both a compensation – an escape from a modern constraining society; and an adaption – an expression of individual freedom in modernity.

From a genetic perspective, a long allele of the Dopamine DRD4 gene has been suggested to indicate a predisposition to risk taking (Persson et al., 2000). From a psychoanalytic perspective, extreme sports participants are seen as reckless 'thrill-seekers' or 'adrenaline junkies' with a death fulfilment wish, and repeated risk seeking behaviours are thought to reflect suicidal tendencies (Pain & Pain, 2005). In contrast, Castanier, Le Scanff and Woodman (2010) maintain that participants who are low in conscientiousness and high on neuroticism, are individuals with a propensity for taking the greatest risks. Self, de Vries Henry, Findley and Reilly (2007) go so far as to claim that extreme sport participants share a common type T personality. They are described as willing to take risks, simply for the sake of the experience.

Extreme sport participation may well be driven by risk attraction and danger (Slanger & Rudestam, 1997; Stranger, 1999; Llewellyn & Sanchez, 2008), but a wealth of research has shown that it is also driven by motives other than pathological risk taking. On a cognitive level, participants are motivated by the desire for challenge, mastery and control (Brymer, 2005). On an emotional level, participation can produce positive feelings of joy and elation (Willig, 2008). It is important to note that different high risk sports satisfy different motives and that participation is not a homogenous experience. Barlow, Woodman and Hardy (2013) examined skydiving and mountaineering. Whilst skydiving was found to satisfy sensation seeking motives, mountaineering was associated with emotion regulation and agency.

Hanson (1989) and Slovic (1987) maintain that extreme sports participants become familiar over time with the risks, which leads to risk desensitisation and a need to increase the danger in order to perceive their activities as risky. In their research on the culture of skydiving, Celsi, Rose and Leigh (1993) reported that the initial euphoria and exhilaration experienced at first, gives way to habituation, or tolerance. The individual becomes accustomed to the behaviour. In order to continue to experience the same emotional 'high', risk taking behaviour increases. Habituation also makes the positive processes and experiences weaker and a craving develops when the behaviour is no longer available. They found that more experienced skydivers attempted riskier and more complex jumps, but as skill and mastery developed in unison, the level of risk was moderated and remained constant. A process of deviance neutralisation occurs (Goode, 1990). An individual goes through a habituation period, where the high risk activity, which was once seen as dangerous, is gradually perceived as the norm. Price and Bundesed (2005) found a similar result – as skydivers progressed from novice to experienced ability, anxiety levels decreased and positive emotions such as happiness and pleasure increased. As the anxiety levels decreased, they also developed an addiction to the experience.

1.2. BASE jumping

BASE jumping has evolved from skydiving. Whereas skydivers jump from aeroplanes, BASE jumpers jump with a specially adapted parachute from fixed objects. The primary requirement is that these objects are high enough to allow the jumper to deploy a parachute to

land safely. BASE jumping is extremely dangerous when compared to skydiving. Skydiving takes place from thousands of feet above the ground, allowing participants ample opportunity to deploy their parachutes. In the event of a parachute malfunction, skydivers carry a reserve parachute, which can be deployed in emergency situations. BASE jumping, on the other hand, tends to take place from much lower altitudes, sometimes less than 300 feet above the ground. BASE jumpers carry only one parachute, as there is no time or altitude to deploy an emergency parachute if a malfunction occurs. Additionally, they face the added dangers of an uncontrolled parachute opening leading to a collision with a fixed object. Even in the event of a safe parachute opening, jumpers face the added danger of landing in very small and restricted landing areas, which can result in significant injury if they miss their landing zone. BASE jumping is also criminalised in a number of places, so in some cases, participants are forced to undertake their sport clandestinely at night, risking both injury from night jumps, and the threat of arrest from the authorities if discovered (Gerdes, 2010).

“BASE is like skydiving, only dangerous” (Laurendau, 2011, p. 404). In terms of serious injury and death, BASE is the most dangerous sport in the world. A study by Westmann, Rosén, Berggren and Björnstig (2008) of BASE jumping from 1981 to 2006 found a fatality rate of one per sixty participants. In comparison, skydiving has 0.01 fatalities per 1000 jumps. Their study found that BASE is associated with a five to sixteen-fold risk of injury and death when compared to skydiving. The first recorded BASE fatality occurred in 1981 and to date, according to the BASE publication, *Bline Magazine* (2017), there have been 315 recorded fatalities in a sport where there is estimated to be currently, approximately 3000 active BASE jumpers worldwide. A study of catastrophic injuries in BASE, conducted by Mei-Dan, Carmont and Monasterio (2012), found that one severe injury occurred for every 500 jumps (the skydiving injury rate was 1.7 per 1000 jumps).

Currently, the fastest growing sub-discipline within BASE jumping is wingsuiting. Wingsuits are specialised jumpsuits that inflate with air in freefall. Wingsuits allow BASE jumpers to achieve increased glide performance over terrain, allowing them the opportunity to ‘proximity’ fly themselves close to the ground, before opening their parachutes. Wingsuiting has added an increased level of challenge to the sport, but the danger of this sub-discipline has led to an exponential increase in danger and fatalities. According to the BASE fatality list

(2017), of the current 315 BASE fatalities, 135 involve wingsuits and currently, wingsuit BASE fatalities are on the increase as this sub-discipline increases in popularity. Mei-Dan, Monasterio, Carmont and Westman (2013) found that most fatalities can be attributed to ground or cliff impact from flight path miscalculations.

Considering that the risk of severe injury and death is an ever present threat in BASE jumping, it would seem irrational that people would choose such a deadly sport. Allman, Mittelstaedt, Martin and Goldenberg (2009) explored the motivations of BASE jumpers by interviewing jumpers at an annual BASE jumping event, Bridge Day, in Fayetteville, West Virginia. They found that an ‘adrenaline rush’ was cited as a primary motivator, whilst secondary motivations were: acquiring a unique/elite skill; a sense of accomplishment; mastery and control; overcoming fear; freedom; a sense of community/ belonging; and a spiritual/personal transformation.

BASE jumping is not a sport that attracts just anyone, and even the most ardent extreme sportsperson, engaged in other risky pursuits, may shy away from the highly committing nature of this sport. Monasterio, Mulder, Frampton and Mei-Dan (2012) investigated the personality type that is drawn to this sport. Their study found that BASE jumpers scored highly on Novelty Seeking and Self-Directedness, and had low scores on the Harm Avoidance scale of Cloninger’s Temperament and Character Inventory – TCI (Cloninger, Svrakic, & Przybeck, 1993). These findings suggest that BASE jumpers may have a distinct set of positive personality traits, characterised as being outgoing, relaxed, confident, courageous, composed and optimistic. Whilst the advantage of these traits is confidence in the face of danger, the disadvantage is the potential for unrealistic optimism with regards to risk taking.

1.3. Emotions and extreme sport

Emotion is a complex phenomenon, comprising several components, such as physiological processes, bodily expressions, action readiness and feeling quality (Oatley & Jenkins, 1996).

Emotion is interwoven with mood, temperament, personality and motivation. Emotion and cognition influence each other - emotions affect thoughts; and thoughts impact emotions (Robinson & Clore, 2002), and emotion shapes behaviour (Baumeister, Vohs, DeWall & Zang, 2007). Emotions are states or feelings that cause physiological and psychological changes for the organism.

Basic theories of emotion propose that a discrete and distinct set of emotions, such as anger, fear, disgust, surprise, sadness and happiness, gave rise to the physiological and phenomenological experience of emotion (Ekman, 1984; Oatley, 1992; Panksepp, 1998). These basic emotions function as building blocks for more complex emotions. A dominant concept is that emotions are functional. They guide attention and prompt action in relation to events that are of concern. From this perspective, each emotion is believed to be a distinct feeling state, each with a distinct physiology, phenomenology and functionality (Vittersø, 2013).

In contrast to the basic emotion concept, the conceptual act theory of emotion premises that emotions such as anger, sadness, fear, disgust or happiness do not arise from distinct brain networks. Instead, they occur from a combination of activity in core brain systems that perform functions such as salience detection, sensory perception, memory and so forth (Touroutoglou, Lindquist, Dickerson & Barret, 2015). Recent neuroimaging studies have shown that these core brain systems are involved with emotional experiences. Emotions therefore, can be construed as 'mental events' that are constructed from interactions within and between networks that manage domain-general mental functions.

Russel (2003) maintains that emotions arise from cognitive interpretations of core physiological experiences. All affective states arise from two neurophysiological dimensions – valence (pleasure) and arousal (activation). This is an alternative explanation of emotion to that of basic emotional theory. Valence (pleasure-displeasure) occurs along one dimension, and arousal (activation-deactivation) occurs along the other dimension. Each emotion is then understood as a linear combination of these two dimensions, or in other words, emotion occurs in varying degrees of valence and arousal. As opposed to earlier theories of emotion

that maintained that a discrete and independent neural system produces each emotion, this model has been found to be consistent with recent findings from behavioural, developmental, neurocognitive and neuroimaging studies (Posner, Russel & Peterson, 2005). Feeling states are categorised into positive and negative affect. The valence continuum describes the quality of the emotional experience, while the arousal continuum describes the intensity of the experience.

Intuitive feelings are still the predominant method by which humans evaluate risk.

Loewenstein, Weber, Hsee and Welch (2001) examined the impact of emotions on decision making during risk taking. While cognitive evaluations of risk are sensitive to probabilities and outcome valences; they found that emotions were sensitive to the vividness of the associated imagery, proximity in time, and probability and outcome valence. As a result, they found that people experience a discrepancy between the emotion they experience with regards to a particular risk, and the cognitive evaluation of the threat posed by that risk. The affect heuristic (Slovic, 2007) is a model of human behaviour that theorises the relationship between emotion and risk perception and behaviour. Emotion is said to be part of the experiential system, which is fast, intuitive and often operates at an unconscious level. When faced with positive or negative feelings related to risk, this 'experiential system' provides a mental 'short-cut' that guides judgement and decision making. Unfortunately, the experiential system is subject to some flaws. Judgements and decisions can be faulty because the emotive components are manipulative and they are subject to the inherent cognitive biases of the experiential system (Slovic, Finucane, Peters & MacGregor, 2004). Therefore, when information is incomplete or overtly complex, humans rely on a number of simple heuristics, or rules of thumb, to arrive at a decision.

Intense feelings have been suggested as a powerful motivator for extreme sport (Willig, 2008). Hetland and Vittersø (2012) explored the emotional quality of the extreme sport experience in BASE jumping and skydiving. They used a quantitative approach but, found that Likert-type scales did not adequately capture the richness and depth of emotional experiences. They found that instead of a wide range of emotions, participants experienced few, but strong and clearly defined emotions, particularly with regard to negative emotions, such as fear. They also found that emotions were reported differently after the jump,

compared to the emotions reported the next day. This could be attributed the effects of the high arousal experienced during the activity, leading to difficulties in information retrieval for a short period after the event (Revelle & Loftus, 1992). They found that emotions also fluctuated dramatically during a risk taking episode, and that risk taking produced fewer, clearer and more intense feelings than those reported from other activities.

An inability to identify and describe emotion in extreme sport was investigated by Woodman, Hardy, Barlow and Le Scanff (2010) and by Barlow et al. (2015). They maintain that individuals who experience a difficulty in differentiating feelings, and expressing them in words (alexithymia), tend to seek out the experience of high risk sport because it provides more easily identifiable emotions (e.g. fear, elation). In order to keep experiencing these emotions, participants may take increasing risks as a result of emotional acclimation, as the participant's reward set-point shifts and risk-taking increases to maintain emotional homeostasis.

The role of emotions in extreme sport may not necessarily always be adaptive. Michel, Cazenave, Delpouve, Purper-Ouakil and LeScanff (2009) found emotional functioning in a group of BASE jumpers to be poor – these individuals were found to be high on the neuroticism scale and showed signs of pathological behaviour, that included higher risk-taking, more accidents and greater drug consumption than a control group. A criticism of this study is that they only recruited a population of 11 BASE jumpers, which may not generalise to the greater BASE jumping community. Castanier, LeScanff and Woodman (2010) found that some individuals use extreme sport as a means of escape from negative affect and as a way of deflecting attention away from the self. Monasterio, Mulder, Frampton and Mei-Dan (2012) carried out a personality study of BASE jumpers using the Temperament and Character Inventory (TCI). The Novelty Seeking (NS) subscale is correlated to Zuckerman's Sensation Seeking (SS) scale (Zuckerman & Cloninger, 1996). BASE jumpers scored highly on the NS sub-scale, which suggests that they are easily bored, excitable and impulsive. High NS suggests an under-arousal in dopamine, which causes these individuals to seek out emotional stimulation in high risk sports.

Buckley (2016) examined the role that the emotions of fear and thrill play in extreme sport. He maintains that exploring these emotional states is challenging because the immediate experience of these emotions during an extreme sport episode is virtually impossible to replicate through virtual or other experimental means. Experimental studies cannot place participants under the immediate risk of death and therefore, subjective and retrospective reports from participants is the only viable method to gather data. He found that during extreme sport participation, individuals tend to differ in their fear and thrill responses. Individuals may also have different responses on different occasions. Fear boosts performance up to a point and thereafter, if fear becomes too extreme, it causes paralysis. Anxiety prior to a risky action differs from the fear experienced during the event itself. He found that fear must be faced and overcome to act. Thrill can occur during or after a high risk action. Below a certain threshold, thrill can occur without fear. Between an upper and lower threshold, thrill increases with fear. The fear and thrill can fluctuate back and forth between the two emotional states. Beyond an upper threshold, thrill vanishes and only fear remains. Additionally, perceived danger generates heightened focus and awareness and fear can disappear during periods of intense concentration. The usual sequence of emotions during a high risk event is fear before the action, intense focus during the activity, and thrill, relief or triumph afterward.

1.4. Fear

The peak moments in life happen when we are afraid at first and then transform our perceptions. This is how we tick. Living in the world without challenge does not inspire us or make us whole. We must break through barriers if we are to live a life fulfilled with epiphany and meaning. It is when we take on true tests of our bravery that we awaken the best parts of ourselves. It is when we truly transcend fear that we are truly alive (Germain, 2007, p. 208).

Fear and anxiety are closely related emotional states that generate aversive, activated states, with negative feelings and intense bodily manifestations, that are focussed on a threat. Fear is

a distressing emotion aroused by the presence of danger, whereas anxiety can be described as an unpleasant foreboding of threat.

Fear is an adaptive response, designed to protect the organism from threat. Humans strive to terminate, avoid or escape from fear-inducing situations. The experience of fear produces emotional, behavioural and physiological responses to threat. Panksepp (1998) calls this a 'fear circuit' in the brain, which influences a number of neurological, chemical, hormonal and physiological processes. The amygdala is the key area in the brain that identifies threat information. When danger is identified, adrenaline, noradrenaline and growth hormone are released into the bloodstream, and the endocrine system releases cortisol, which metabolises energy-bearing glucose. Blood pressure increases, allowing the delivery of nutrients and oxygen to vital areas of the body. Respiratory rate increases, and the pupils dilate to perceive movement. The body is now prepared for the flight, flight or freeze response (Gray, 1987; Llewellyn, 2003).

Fear also enhances focus. Noradrenaline is released into the prefrontal cortex, the area in the brain of higher cognitive function. The α_2 -neuroadrenaline protein receptor increases neural efficiency, which creates a state of optimal arousal – intense focus and concentration, whilst paradoxically creating a sense of calm and peace (Wise, 2009). If stress gets too high, noradrenaline triggers the α_1 -neuroadrenaline receptor, which shuts down prefrontal cortex efficiency and the ability to think through danger is lost (Germain, 2007). He suggests that an optimum state of fear arousal exists, based on the balance of two variables – perceived risk versus perceived ability. When perceived ability is high and perceived risk is low, we become under-stimulated and bored, resulting in higher risk-taking to increase arousal. When perceived ability is low and perceived risk is high, we become afraid and feel out of control. This is the homeostasis of risk.

Very little research has examined fear in extreme sport. Allman, Mittelstaedt Martin, & Goldenberg (2009) found that BASE jumpers reported that overcoming fear was a primary motivator for participation. According to Brymer (2005) and Brymer and Schweitzer (2012), extreme sports participants are generally less anxious than the average population, but still

experience fear and anxiety during high risk sports. They maintain that overcoming fear is a transcendent experience in extreme sport. Participants are able to attain a greater understanding of themselves. High risk sports, where the threat of injury and death is a distinct possibility, are stressful pursuits for participants. Monasterio et al., (2016) investigated stress reactivity in a group of BASE jumpers. They examined cortisol reactivity in the Hypothalamic-Pituitary-Adrenal (HPA) axis, alpha-amylase (norepinephrine) reactivity in the sympathetic Arousal System (SAM) and personality types. They found that stress reactivity was low in individuals with high resilience as a character trait (low Harm Avoidance and high Persistence and/or high Self-Directedness). This, according to their research, is a common character trait found in individuals who participate in BASE jumping.

1.5. Thrill

The experience of thrill is a sudden feeling of excitement and pleasure. Related terms include exhilaration and euphoria. The drive to pursue excitement and pleasure is called sensation seeking. Zuckerman (1979) defines sensation seeking as a personality trait that is expressed by the generalised tendency to seek out varied, novel, complex and intense sensations and the willingness to take risks for the sake of these experiences. He developed the Sensation Seeking Scale (SSS), which consists of four subscales: Thrill and adventure seeking (TAS), Experience seeking (ES), Disinhibition (Dis) and Boredom susceptibility (BS). Sensation seeking and impulsivity are strongly correlated. He maintains that high sensation seekers tend to estimate the risk and danger of activities as lower than low sensation seekers. High sensation seekers also anticipate more pleasure and less anxiety if they are actively engaged in the activity, and are most likely to engage in high risk sports. High scores on the Thrill and Adventure Seeking (TAS) subscale of the Sensation Seeking Scale (SSS) have been reported for practitioners of a diverse range of extreme sports (Hymbaugh & Garrett, 1974; Diehm & Armatas, 2004).

According to Zuckerman (2002b), genetic studies have shown a high heritability for sensation seeking and a specific gene: the dopamine D4 receptor, was found to be related to novelty seeking. Monoamine oxidase (MAO) is an enzyme that has important functions in the

regulation of sensitivity to reward, emotional and behavioural arousal. Negative relationships have been found between MAO levels and sensation seeking (Schalling, Edman & Osberg, 1983). High sensation seekers therefore tend to have low MAO levels. High testosterone levels in plasma and cerebrospinal fluid are associated with high sensation seeking in males. Zuckerman (1994) proposed that reactivity of dopamine in the brain's reward system drives the approach motive, while the reactivity of serotonin in the raphe nucleus is the basis of control for impulsivity in high sensation seekers.

In their research on the normalisation of risk, Celsi, Rose and Leigh (1993) found that over time, tolerance to risk grows as the fear experience diminishes – termed fear habituation. Zuckerman (1979) maintains that this process of risk normalisation is influenced by the need for sensation seeking, and has a neural explanation. When a threatening situation is experienced, endorphins flow into the bloodstream. Endorphins create an intense feeling of pleasure once the threat has passed, which can bring about a state of euphoria and well-being. Netter, Hennig and Roed (1996) found that high levels of dopamine and serotonin mediated sensation seeking behaviour. A surge of dopamine is also released into the insula, triggering the reward system of the nucleus accumbens, and creating an extremely pleasurable and addictive experience. In order to sustain the 'dopamine high', risk taking needs to be exponentially increased to continue to achieve the same hedonic experience.

Reversal theory (Apter 2001; Kerr; 1997) is a theoretical model of motivation, emotion and personality that has been used to explore risk sports. Four pairs of meta-motivational states are frames of mind that influence a person's motives. A person in the paratelic state is playful and arousal-seeking. This creates a subjective protective frame around the experience. The danger associated with this state is that the experience of danger may be perceived as pleasurable and potentially, this may skew their appraisal of risk, creating an overconfidence in their ability to deal with hazardous situations.

Buckley (2012) maintains that rush is a particular type of emotional and psychological state. It involves the experiences of thrill and flow. Thrill refers to an adrenalin based physiological experience; whilst flow comprises the intense absorption and focus in a skilled activity. The

outcome is an extended state of elevated enthusiasm which continues beyond the activity itself. Rush requires intense mental concentration and physical coordination, paired with elevated adrenalin levels and intensive emotional engagement. Rush is not a universal experience, but instead, is available only to individuals who have invested the time to acquire certain skills. He believes that rush is addictive, and once someone has experienced rush, it is likely that they will pursue that experience again.

1.6. Flow

Flow is “a state of optimal experience, in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (Csikszentmihalyi, 1991, p.4). As a state of optimal functioning, flow is where we feel and perform our best (Kotler, 2014). Flow is a succinct way of expressing the effortlessness of this experience (Jackson, 1996). Flow is evoked when there is a clear balance between the challenge of the task at hand and the ability of the person engaged in the task, and when one is poised between a state of relaxation and anxiety. Csikszentmihalyi (1975) describes flow as an autotelic experience – one that is undertaken purely for its own ends.

Kotler (2014) maintains that the experience of flow contains three basic properties: a profound mental clarity; emotional detachment; and the automatic nature of the experience. Csikszentmihalyi (1991) defined the core components of the flow experience as:

1. Goals are clearly defined
2. There is a high degree of concentration.
3. There is a transformation of time (time slows or speeds up).
4. Direct and unambiguous feedback occurs from one’s actions.
5. There is a balance between ability and the challenge.
6. An autotelic experience occurs (action is effortless, as the activity is intrinsically rewarding).
7. A loss of self-consciousness takes place (a merging of action and awareness).

8. There is a narrowing of awareness (absorption) down to the activity itself.
9. A paradox of control occurs (exercising control without actively trying to be in control).

Csikszentmihalyi and LeFevre (1989) maintain that flow delivers a state of profound happiness and wellbeing. Kotler and Wheal (2016) believe that flow is a highly desirable state sought by extreme sport practitioners, in order to maximise their performance. They found that flow enhances decision making, liberates one from self-doubt, fixes one in the present (with no sense of the past or future), and removes a sense of physical consequences, such that even the fear of death can no longer exist. It also allows athletes to operate at their peak performative ability. According to Germain (2007), flow is the antithesis of fear. In flow, the unconscious mind leads the experience, whilst fear is experienced by the conscious mind. He maintains that in extreme sport, the way to overcome fear, is to find the path to flow.

In flow states, parts of the prefrontal cortex deactivate, termed transient hypofrontality (Dietrich, 2003; Dietrich 2004). Hypofrontality occurs when the explicit information system in the brain (declarative memory: memories that can be consciously recalled) becomes overloaded with information and the implicit information system (procedural memory: memories that are unconscious) takes over. Sources of non-essential information are ignored. The 'inner critic' is silenced (Celsi, Rose & Leigh, 1993). This makes risk taking seem less frightening. Large parts of the neocortex are also deactivated, distorting the ability to compute time, whilst energy for temporal processing is relocated to attention and awareness. This explains the intense focus achieved in the flow state. Flow state also releases a range of neurotransmitters (Kotler, 2014). Dopamine, which is released during risk taking behaviour, increases attention, information flow and pattern recognition. Norepinephrine also increases attention and arousal, enhancing focus. Anandamide amplifies lateral thinking and inhibits the ability to feel fear. Endorphins produce an intense pleasure feeling, whilst serotonin is released at the end of the flow state, creating a happy afterglow sensation.

The benefits of flow are increased performance, heightened intrinsic motivation, enhanced gratification, and the mastery of a pursuit increases. In a study of big-wave surfers, flow was found to enhance mood states, performance, self-esteem and fulfilment (Partington, Partington & Oliver, 2009). There is also a down-side to flow according to the study. Flow was found to increase dependence on the euphoric experience, regardless of the negative consequences associated with this pursuit. Csikszentmihalyi (1991) noted the addictive nature of the flow experience – flow is so enjoyable that people will seek it out, even at great cost. In a study of kayakers and climbers, Schüler and Nakamura (2013) found that flow is associated with low risk awareness and greater risk taking behaviour.

In summary, research to date on BASE jumping has focused on the motivations for participation (Allman, Mittelstaedt, Martin & Goldenberg, 2009) and personality characteristics (Monasterio, Mulder, Frampton & Mei-Dan, 2012). Studies have investigated BASE jumping accidents from a statistical perspective (Westmann, Rosén, Berggren & Björnstig, 2008) and physiological perspective (Mei-Dan, Carmont & Monasterio, 2012; Mei-Dan, Monasterio, Carmont & Westman, 2013). There is a distinct lack of research regarding the psychological aspects that may lead to accidents in BASE jumping, particularly with regards to risk appraisal, judgement and decision making in the sport. Willig (2008) maintains that intense feelings (fear, thrill etc.) are powerful motivators of behaviour in extreme sport. The only research on emotions in BASE jumping (Hetland and Vittersø, 2012) examined the emotional intensity, but the findings failed to explain how these intense emotions impact upon thoughts and behaviours in the sport. It is the intent of this study to explore the emotional experience and examine how these emotions impact upon psychological aspects such as risk taking, judgement and decision making in BASE jumping. It is hoped that a greater understanding of the psychological factors in BASE jumping may lead to increased safety in the sport.

Chapter 2

Method

2.1. Aim

This study examines the emotions that people experience when participating in the sport of BASE jumping. Emotions impact upon thoughts and behaviour. Emotions may influence judgement and decision making, which may impact upon risk taking in the sport. The aims of this study are two-fold:

1. To explore the emotional experience of BASE jumping.
2. To understand the implications of these emotions for BASE jumpers.

2.2. Research Approach

Approval for the research was granted by Massey University Human Research Ethics Committee (See Appendix A). A qualitative research methodology was utilised. One-on-one interviews were conducted with participants and thematic analysis was employed to analyse the data. Qualitative research methods are diverse, complex and nuanced, and allow the researcher to access personal perspectives and subjective interpretations of participants (Holloway & Todres, 2003). Thematic analysis is a foundation method for qualitative research across a wide range of theoretical and epistemological approaches (Braun & Clarke, 2000). It is a method for identifying, analysing and reporting patterns of common information (themes) within data, which is highly flexible and useful for summarising key points in a large body of data. As well as allowing for ‘thick’ description of the data set, it highlights similarities and differences within the data, allows for theoretically-informed and emergent

interpretations, and most importantly, it can generate unanticipated insights (Braun & Clarke, 2013).

2.3. Participants

Participants were recruited via an on-line advertisement placed on two Facebook closed-group sites: Snake River BASE Academy Alumni and New Zealand BASE (see Appendix B). Access to these groups is only available to BASE jumpers approved by the site administrator. The researcher is an approved member of both groups. Potential participants needed a minimum criteria of 10 BASE jumps and at least 3 months of BASE jumping to be eligible to participate. A total of 20 BASE jumpers volunteered for the study. Each participant was de-identified, so as to retain anonymity for the study (e.g. BASE jumper A, BASE jumper B etc.). In some areas, BASE jumping is illegal, and for the purposes of the study, participants were asked not to discuss any illegal activities that they had undertaken in the sport.

All participants were male ($n = 20$). The ages ranged from 26 to 66 years old ($M = 40.5$, $SD = 12.17$). The nationalities were Australian, New Zealand, South African, American, Canadian, English, Scottish, Irish, Dutch and Indian. The occupations of jumpers were diverse, ranging from a university student to a college professor; from electrical technicians to a retired physician; and from tandem skydiving instructors to a commercial diving supervisor. The most recent participant started jumping in 2015, whilst the longest participant started BASE jumping in 1989. The lowest number of BASE jumps was 34 and the highest number was 624 ($M = 186$, $SD = 169.34$). The focus in BASE jumping activities ranged from jumping low objects, tracking terminal objects and doing aerals, to wingsuiting. The most preferred object to be jumped was cliffs (Earth) and the least preferred was Antennae. The highest number of accidents (requiring hospital treatment) per jumper was two. The highest number of close calls (may have ended in injury or death if evasive action was not taken) per jumper was ten.

2.4. Procedure

Prior to the interview, participants were sent an information sheet about the study and were asked to complete a consent form and a demographic questionnaire. One-on-one interviews were carried out via Skype and recorded using Evaer software. Interviews ranged from 20 minutes to 59 minutes. A total of 708 minutes of interview data was recorded.

Prior to conducting the interviews, the researcher participated in a bracketing dialogue with an individual with expertise in qualitative research methods (D. Green, personal communication, 12 December 2016). According to Dale (1996), bracketing allows the researcher to explore potential biases and presuppositions about a subject. In the case of this study, the researcher had previously participated in BASE jumping. This may have presented conflicting assumptions and biases about BASE jumping, and bracketing was employed to control for this potential conflict. The researcher did a personal audit to explore his own emotional experiences while BASE jumping and from this identified potential biases, assumptions and interpretations. These were cross-referenced against the interpretations of the data during analysis. Interpretations were triangulated in a number of ways. Similar data was gathered from different sources (interviews, literature and personal communications), as well as from a variety of interviewees (Yin, 2009). A pilot interview, which lasted 40 minutes, was also undertaken via Skype with an acrobatic paraglider pilot. Although the individual was not a BASE jumper, acrobatic paragliding is a high risk sport and the activity has a number of parallels with BASE jumping. The pilot study was carried out for the researcher to refine the interview questions, format and technique.

To find a balance between flexibility and structure, a semi-structured interview guide was developed to guide the interview process. The interview posed a set of questions to encourage participants to describe their lived experience and facilitated the development of a constructive relationship between the researcher and the participant (Eatough & Smith, 2008). The interview template covered a number of related aspects of BASE, where it was assumed that there would be an emotional impact for the participant in the sport. Notes were also taken during the interview and used as prompts to guide follow-up questions, and to

explore various points of interest in more depth. The questions covered the following aspects of BASE jumping:

1. Motivations to become a BASE jumper.
2. The emotional experience of preparing for a BASE jump.
3. The emotional experience at the exit point, just prior to the jump.
4. The emotional experience of the jump itself.
5. The post-jump emotional experience.
6. The emotional experience of a jump that went wrong.
7. The risks, dangers and challenges of being a BASE jumper.
8. The rewards of being a BASE jumper

At the beginning of each interview, participants were told that the researcher was interested in any motivations, attitudes, perceptions, emotions, physical experiences, thoughts and social aspects that related to the BASE jumping experience. After completion of the interviews, the data were transcribed verbatim for analysis. The researcher listened to each interview and read through each transcription a number of times, using a notebook for general notes on the themes within the data (Maykut & Morehouse, 1994). Parts of the transcript that were identified as being significant (words and phrases) were highlighted and the question was asked, "How does this relate to the emotional experience of BASE jumping? Is this as a result of my own bias, or is there another explanation here?" The goal was to identify patterns of descriptions that reflected important aspects of the emotional experience of BASE jumping. Patterns of descriptions with similar meanings were grouped into themes, and sorted into lower and higher order themes.

The researcher was guided by the recommendations of Braun and Clarke (2002) on how to conduct thematic analysis. The following steps were used:

1. **Transcription:** The data were listened to repeatedly whilst the transcription process was undertaken. The transcribed data were checked against the recorded data. This allowed the researcher to develop a strong familiarity with the data.

2. Coding: Each data item was given an equal amount of attention. A list of initial ideas about the data was generated and then the entire data set was coded by highlighting potential patterns and meanings. The initial list of codes was sorted into potential themes.
3. Analysis: Mind maps and diagrams were drawn up to help visualise the connections between themes and sub-themes. Data was ‘made sense of’ – rather than just paraphrased and described. The aim of the analysis was to tell an organised story about the data and topic. A final re-reading of the data and recoding and regrouping of the themes was undertaken to explore latent themes embedded within the data. As such, themes did not just ‘emerge’ – the researcher was ‘active’ in the research process.

<i>Raw themes</i>	<i>Sub-themes</i>	<i>Main themes</i>
Expressions of fear Fear changes in form and intensity during the jump Fear cycles between positive and negative emotions Fear focus changes with experience Fear overcomes flow Subjective nature of fear	The saw-tooth of fear	Negotiating the fear
Overcoming and controlling fear Fear coping strategies Changing fear to flow Withdrawal – walking away Staying fearful Adaptive role of fear Transformational nature of fear	Managing fear	

<i>Raw themes</i>	<i>Sub-themes</i>	<i>Main themes</i>
Manifestations of flow An emotionless experience Seeking flow Accessing flow The attraction of flow The threat of flow	The allure of flow	Negotiating the rush
Expressions of thrill Thrill changes in form and intensity during the jump Thrill cycles between positive and negative emotions Post-jump euphoria Post-jump savouring Thrill is addictive Tolerance develops	Chasing the thrill	
Feeling free The right to autonomy The dilemma of freedom Family tensions Redefining risk taking	Guilt: The price of freedom	Negotiating the discord
The dark side of BASE The life/death paradox Reframing injury and death Neutralising feelings Acceptance of death	Denial: The prospect of injury and death	

Table 1. Hierarchical development of themes.

Validity was established by a number of methods. First, as far as possible, the report uses participants' own words to provide a rich and textured description of the interviews (Kerry & Armour, 2000). Information was also triangulated by cross-comparison with other non-academic sources such as personal communications with BASE jumpers and on-line BASE jumping literature such as BASEjumper.com. According to Jick (1979), a multiplicity of data sources confers a degree of convergent validity to the research. The researcher kept a logbook

of the research process, to document all thoughts processes, reasoning and procedures during the study (Dale, 1996).

Chapter 3

Findings and discussion

Three themes, each comprising two sub-themes, emerged from analysis of the interview data:

- 1) Negotiating the fear.
 - a) The saw-tooth of fear.
 - b) Managing fear.
- 2) Negotiating the rush.
 - a) The allure of flow.
 - b) Chasing the thrill.
- 3) Negotiating the discord.
 - a) Guilt: The price of freedom
 - b) Denial: The prospect of injury and death.

3.1. Negotiating the fear

(a) The saw-tooth of fear.

Findings

Fear encompassed a range of emotions: anxiety, apprehension, trepidation, dread, worry, nervousness, unease and so forth. Each participant's reported experience of fear was subjective and varied according to the perceived risk of each jump. Reported fear appeared to be low when participants were jumping at a regular location where they appeared to be very familiar with the risks related to that jump site. Fear appeared to be highest when participants

were jumping new objects or attempting new manoeuvres for the first time. The common thread was that they all spoke about experiencing fear to some extent. For one participant, fear was a predominant experience on most of the jumps that he had done so far.

Gearing up is where the anxiety catches up. I'm sweating a lot. I'm really scared and literally shitting bricks in my pants. When I put my helmet on my hands are shaking. The anxiety keeps increasing as I approach the exit point. About 20 seconds before exit the fear is really high – I can feel my heart beating, maybe 200 beats per second (Jumper R).

Participants reported that they generally started to feel anxiety days before a jump, especially if the jump was particularly challenging. This started off as a very mild feeling of nervousness, which increased in intensity as the jump drew nearer, and peaked as they approached the exit point. Their emotions also fluctuated between positive and negative feelings in the period leading up to the jump. Jumper F experienced a mixture of 'amazing and beautiful' emotions leading up to the jump. Jumper L described his emotions as cycling between 'excited fear' and 'happy anxiety'.

The common reason given by participants in the early stages of their BASE jumping career for anxiety leading up to the jump was due to 'gear fear'. This was described as being a feeling of nervousness and uncertainty about whether or not their parachute had been packed correctly. As their experience increased, confidence in their abilities also increased and the gear fear diminished, allowing them to direct their attention to other aspects of the jump. It appeared that the focus of their fear changed as their experience increased.

You do your pack-job and once it's done you don't want to think about it. In the early stages of BASE jumping you get what jumpers call gear fear. I used to always worry about the pack job, but then as you naturally progress through, you kind of lose that gear fear, but you always have fear of the jump (Jumper D).

Not all the participants found the experience of fear to be unpleasant. One participant described his experience of fear as being both alluring and pleasurable.

I must like the fear feeling, because I keep on coming back (Jumper N).

Participants reported that fear peaked as they stood at the exit point, whilst their experience of excitement at that moment had reduced dramatically and was negligible.

In that moment you are super alert, you are anxious and scared, and all of these emotions have to be controlled and contained, and this is where you have to calm yourself down (Jumper M).

A common report from many of the participants was that at the moment of commitment, when they decided to jump, the fear completely vanished. The experience of fear was not reported in freefall by any participants.

You leave the exit point and at that point you are so in the moment that nothing else goes through your head. Nothing that happened a minute or ten years ago, and nothing that you have planned for the next ten minutes or five years matters, it doesn't exist. You are so in the moment and focussing 100 percent on what you are doing right there and then (Jumper M).

In those moments when I'm standing on an exit, I just let the world drop away from me and I don't have a thought, I don't have a worry, I don't even have happiness – I don't have anything. I'm in the moment you know...and it's without a doubt why I BASE. It's chasing that moment of purity and simplicity. It's the most stripped down, bare, beautiful experience that one could ever wish for” (Jumper F).

In some circumstances (two participants), fear re-emerged during the jump. This was at the time of parachute deployment. Most participants reported feeling a sense relief once their parachute had opened. Jumper P described the canopy opening sequence as the most dangerous point of the jump. This was the point where a malfunctioning canopy could cause the parachute to automatically turn 180 degrees, leading to an object strike, unless the jumper took immediate action to rectify the situation. Participants also reported that flying the parachute to landing, especially if the landing area was restricted, was a stressful period of the jump:

My canopy opens and that's the second time when I'm really shitting myself, and it scares the hell out of me every time when I come in to flare and land (Jumper R).

We have a saying that once the canopy opens, the jump actually begins. Now is the time where you really need to perform because the most dangerous part of the jump is the opening sequence and the five seconds immediately following that because that's usually when a lot of object strikes or different things will happen (Jumper P).

Discussion

The experience of fear in BASE jumping appears to be a complex phenomenon. Fear in BASE jumping needs to be distinguished from the common language understanding of fear. In everyday life, fear represents an emotion which is to be avoided, or if it is encountered, is responded to by the fight, flight or freeze response. The experience of fear is synonymous with BASE jumping, and as such, BASE jumpers appear to have a different experience of fear to that of everyday society. Fear is something that needs to be embraced and recognized as an inherent part of the sport, rather than to be avoided.

Fear is not a static or constant emotion in BASE jumping. It transitions in form and intensity throughout the jump. The experience of fear for each individual was different. Fear fluctuated in form and intensity as participants described negotiating the various stages of a jump, from the preparation stage taking place days before a jump, to the moment they landed safely. Fear

in the early preparation stages is a subtle experience of nervousness, which increases steadily until it reaches a point of maximum intensity at the exit point. During the lead-up to the jump, emotions were reported as fluctuating between negative states of fear and positive states of excited anticipation. This is consistent with the findings of Buckley (2016). He examined a number of extreme sports, such as white water kayaking and hang-gliding, and found that fear oscillated with thrill in the lead-up to a high risk activity. He called this the saw-tooth effect of emotion. Emotions appear to be in a state of flux as jumpers deal with both the excitement and anticipation of the jump, whilst having to manage the anxious emotions too. He also maintains that within a certain range of intensity, increased fear leads to increased thrill. This was less obvious in the participant's reports of fear, although some participants found the build-up of fear before the jump to be a mildly pleasant feeling, which enhanced the anticipation of the impending jump.

Standing on the exit point, preparing to jump, was reported as being the moment of greatest fear for the participants. Hetland and Vittersø's (2012) findings show that a peak of emotional intensity occurs on a BASE jump at a point just before the jump. There was an absence of pleasurable emotions and only fear was reported at that moment. This too, changed abruptly and disappeared as participants reported committing to the jump. Buckley (2016) found a similar result. Immediately prior to engaging in a high risk activity, thrill gives way to fear, which in turn disappears at the moment of engagement with the activity. He maintains that perceived danger intensifies focus and awareness at the final moments leading up to engaging with a risky activity. Most participants in the study reported heightened concentration in the final moments before the jump. Brymer (2005) called this the 'activity phase' where fear and 'mental chatter' dropped away and the experience gave way to an experience of flow. Kotler (2014) believes that the autotelic nature of flow prevents fear from intruding into this stage of the experience. During the freefall stage, most participants reported experiencing elements of flow such as a transformation of time, a merging of action and awareness, intense concentration and an absorption in the task. This may explain why none of the participants reported experiencing fear during the freefall stage of the jump. Buckley (2016) believes that during this stage, because the focus is on control, all emotions disappear. He maintains that the absence of emotion lasts for as long as heightened concentration is maintained.

A few participants reported a re-emergence of fear once their parachute opened. Buckley (2016) found that a powerful burst of 'in-the-moment' fear can return instantaneously and this will overcome emotionless sensation (flow). If fear returns, it does so at a faster rate than thrill is felt, following success. This experience of fear is generally short-lived, and if control is regained, it is replaced by concentration. Fear and thrill may also alternate in response to very short-term actions and perceptions. If the moment of danger is passed, there may also be no experience of thrill at all, but only one of relief.

It appears that fear fluctuates in form and intensity during a BASE jump. Emotions also oscillate in a 'saw-tooth' manner, back and forth, between fear and thrill states. This is consistent with the findings of Buckley (2016), which suggests that the emotions experienced by BASE jumpers is consistent with the emotional experience of other high risk sports participants. It may be that it is not so much the type of extreme sport that is undertaken, but rather the nature and danger of these sports that facilitates the 'see-saw' of emotional experience.

(b) Managing fear

Findings

The need to control and overcome fear was a prominent narrative. Participants discussed a variety of coping strategies to manage the fear, to calm themselves, and focus themselves on the activity. Coping strategies varied amongst participants. They generally used active (task-focussed) coping strategies in the early stages of the jump. These included practical activities such as meticulously packing their parachutes, checking the weather conditions and making a risk assessment of the object they were intending to jump. This helped to create a feeling of confidence, both in their equipment and in their ability to negotiate the jump safely. Some participants used distraction on the walk up to the jump, to help them relax and delay the onset of anxiety. Others used cognitive-based positive self-talk strategies to reassure themselves on the approach to the jump. These strategies changed at the exit point. Ritual became an important strategy: gearing up in the same sequence every time, doing systematic pre-jump gear checks and repeated pilot-chute touching were common behavioural strategies.

I get to the exit point and go through my gear-up. Generally, I'm quite fastidious – my rig is packed the same way. I do my gear checks the same way. I check everything. I don't rush anything. I just get into a bit of a zen state (Jumper Q).

Ritual then gave way to focussing, deep and slow breathing, and visualisation (positive imagery). This was the predominant strategy employed by most participants just before jumping. Participants said that this helped them manage their fear, calm them, and achieve a state of heightened concentration before the jump.

You put your rig on your back and it signals its game time. I'll be in a very focussed mindset, just focussing on breathing and running mental checks, visualising the jump. I put myself in the situation so intensely in my mind that by the time I would actually get out there to perform it would feel like I have already done it (Jumper P).

At the exit point, participants reported that their fear receded when they committed to the jump by starting their countdown sequence.

As soon as I commit by starting the count, the nervous twitch in my leg disappears, everything just blanks out and it all becomes automatic after that (Jumper L).

Standing on exit, all emotions evaporate and the only thing that's left is you and what's ahead of you (Jumper P).

Withdrawal was, in some circumstances, used as a coping strategy. Most participants said that they were comfortable with their decision to walk away from a jump if things didn't feel right.

Sometimes I've just walked away from stuff where the packing's good, the weather's good, and for whatever reason I'm not just 100 percent into it. I've walked down on lots of jumps and I couldn't really explain why – sometimes I have a doubt and I can't override it, so I don't do it (Jumper Q).

There was one exception. A participant feared social judgement and was not at all comfortable with the decision to walk away from a jump.

My greatest fear is not jumping. For me, I don't want to be seen to pull out. I want to believe in myself to complete the task. If its calm and the conditions are right, I'm going no matter what. I'm not pulling out for anything (Jumper O).

The adaptive role of fear was a strong narrative amongst participants. In order to manage risk, they believe that fear can play a positive role. They maintain that too much fear leads to hesitation or panic when called upon to act in an emergency situation, whilst too little fear leads to poor risk perception and excessive risk-taking. They mentioned complacency and overconfidence as being major threat issues; whilst appropriate levels of fear lead to caution and good decision making. Fear may function as an 'amber light' and prevent individuals from attempting jumps that are beyond their capabilities.

Fear is the key. The day I'm not afraid of these jumps, I think I'm going to die. I think I'm going to do something stupid on a jump and I'm going to die (Jumper R).

Being afraid is a good thing because it will give you a heightened sense of awareness; but you can't let that fear override you to the point where you can't think and make good decisions. There's a good middle ground (Jumper Q).

Discussion

It can be assumed that undertaking a BASE jump, where the threat of severe injury or death is ever present, is a stressful undertaking. The coping mechanisms to manage stress and enhance performance that participants employed, are similar to the strategies used by athletes in various other highly committing sports. Orlick (1996) maintains that there are seven critical components to achieve personal excellence in sport. They are commitment, belief, positive imagery, mental readiness, full focus, distraction control and on-going learning. Burke and Orlick (2003) found that high altitude climbers employed all these skills in order to gain the summit of Mount Everest. In terms of emotion-based coping skills to overcome anxiety in sport, Gould, Eklund and Jackson (1993) found that techniques such as

visualisation and controlled breathing allowed athletes to achieve a state of relaxation and focussed concentration. Effective emotion-based coping skills also enhanced performance. Participants in the current study employed a number of coping strategies to manage their fear. The most effective strategy was a combination of focussing, deep and controlled breathing, and visualisation. These strategies achieved a number of outcomes: anxiety was reduced, a calm and mindful 'zen-like state' was attained and concentration was heightened. According to Kotler (2014) and Buckley (2016), it is this state of heightened focus and attention that allows access to the flow state, which in turn, enhances performance. The implication is that effective coping strategies, employed mainly to control strong emotions such as fear, may play an important additional role during the preparation stage of a BASE jump; and jumpers that have mastered these coping skills may also be afforded immediate access to flow state, and increased performance during a jump. Further future research will be necessary to examine this idea.

The decision to walk away from a jump, considering that a high level of physical preparation and emotional investment occurs in the preparation stage, may be a stressful state for some BASE jumpers. Stress is defined as "a function of highly demanding situations coupled with the person's limited emotional resources for effectively coping with these demands" (Anshel, Williams & Williams, 2000, p. 752). The high level of stress associated with the sport was validated by Monasterio et al. (2016) in the research on stress reactivity. Jumper P believes that BASE jumping is the ultimate test in personal responsibility and sometimes this means making a difficult choice by choosing not to jump. An approach coping style involves direct and active engagement with a stressor and is an effective method to resolve emotional conflict (Roth & Cohen, 1986). The majority of participants spoke about feeling confident about choosing to walk away if they felt uncertain about a jump. This suggests that most of those in the study employ effective coping strategies to manage stressful decisions during high risk situations. This may not generalise to the entire BASE jumping population though as other variables such as poor coping styles, social pressure, poor risk appraisal, and so forth, may still impact individuals within the BASE jumping community. Laurendau (2011) examined the role that masculinity plays in BASE jumping. He maintains that participants in high-risk sports struggle with the tension between social solidarity and unity. One participant in the study found it difficult to walk away from a jump and it suggests that the fear of social judgement may play a role in influencing some individual's decision making ability in BASE jumping. Future research will be necessary to examine this issue.

” Extreme sports participants embrace fear, claim that fear is a ‘friend’ and once the ability to recognise and invite a relationship with fear is learnt, fear can be experienced as transformational” (Brymer & Scheitzer, 2012, p. 8). Those in the study maintain that fear plays an adaptive role in controlling and overcoming fear. The need to remain fearful in order to stay safe, and the need to overcome fear, appear contradictory. The importance of listening to fear as a protective mechanism will not occur if fear is to be suppressed. Fear is an adaptive response that protects an organism from threat and harm. Becoming accustomed to fear may normalise this emotional state, leaving jumpers vulnerable to the normalcy bias. This occurs when individuals underestimate the possibility of disaster and instead, interpret warnings (e.g. fear) in an optimistic way (i.e. “fear keeps me safe”). An optimum amount of fear is beneficial to prevent complacency and overconfidence, but relying solely on fear as a protective mechanism may be a misguided expectancy. Fear may be useful, but good judgement and decision making relies on more advanced cognitive processes and skills. Fear may enhance a cautious attitude, but a more practical approach to safety management may be through the development of enhanced risk appraisal skills to improve judgement and decision making

3.2. Negotiating the rush

Buckley (2016) believes that the experience of rush occurs as the result of a combination of flow and thrill.

(a). The allure of flow.

Findings

For most participants, the emotional experience of the jump was difficult to recall or describe. A common description of the jump itself was that of an emotionless experience. Those that were able to articulate the experience described a narrowing of focus (absorption) to the task at hand; a high degree of concentration; a sense of effortless personal control; and a distorted sense of time.

Every fraction of a second goes by in a way that you are able to perceive it and affect the outcome (Jumper B).

It's just myself, not everyday life, because in those few seconds nothing else matters except the moment (Jumper L).

I can hear the folds in the pilot-chute unravel, I feel the pins pop individually, I feel the pressure come off my back as the canopy opens. It seems to take forever, when its actually only about one to two seconds (Jumper P),

These quotes describe flow: a state of effortless and unconscious absorption. Flow state is highly pleasurable and participants reported seeking it out. The flow state may prove to be elusive though - not every jump results in participants achieving flow. Flow depends on a balance between ability and challenge (Csikszentmihalyi, 1975). When this balance does not occur, things can sometimes go wrong on a jump. Jumper E described a near fatal accident where he elected to jump when feeling out of focus due to a number of external distractions. The jump was at the extreme of his ability. He failed to achieve a level of performance to clear a ledge in freefall. He struck the ledge, but fortunately managed to open his parachute. He landed with significant injuries from the cliff-strike. A threat of flow is that it can also lead to pushing for a peak experience through peak performance, leading to highly dangerous situations. "Flow makes you feel invincible, right up to the moment when you're not "(Kotler, 2014, p. 819).

I was tracking; I wanted to go further, I wanted to go faster, I wanted to go lower than everyone else; and I pushed and I pushed, and I eventually went well past, way past the acceptable limits for a BASE jump (Jumper O).

There is a certain height above the ground that BASE jumpers consider safe to deploy their parachutes and still have time to fly to a safe landing area. Jumper O went well below this acceptable opening height limit and impacted the ground immediately after his parachute opened. He was only saved from certain death by striking a tree as his parachute deployed, cushioning the impact somewhat, but it still resulted in serious injury to himself.

Discussion

Buckley's (2016) findings are consistent with the participant's recollections of the jump. The high level of focus and concentration at the commencement of the jump gives way to an emotionless state. A state that Csikszentmihalyi (1975) calls flow. Flow occurs in an effortless and unconscious manner, which may explain the inability of participants to accurately recall and describe the jump. Flow fosters a state of intense happiness too. Csikszentmihalyi (1991) described flow as an optimal motivational state. Flow was found to be associated with wellbeing and enhanced mood (Csikszentmihalyi & LeFevre, 1989). Csikszentmihalyi (1991) maintains that flow leads to post-flow happiness. "Flow feels like the meaning of life for good reason" (Kotler, 2014, p. 279). The neurochemicals that are associated with flow (dopamine, norepinephrine, anandamide, endorphins and serotonin) lead to intense feelings of post-flow euphoria. Autonomy, mastery and purpose are strong intrinsic drivers. They are highly rewarding and are also deeply woven into the flow experience. This it would seem, explains the alluring attraction of the flow state for BASE jumpers.

Flow presents a paradox. Participants reported that flow was a highly desirable state to achieve peak performance. The need to match the skill/challenge ratio that is crucial for flow (Lawther, 2003) sits in opposition to the need to balance the safety/risk ratio in extreme sport. As a jumper's skills increase, so does the need to increase the challenge, in order to continue to access flow. At some point a skill/challenge mismatch may occur. There is also an absence of fear during this period of intense focus and concentration (Buckley, 2016), and therefore, fear cannot perform its function of moderating risk taking as the limits of physical ability are approached. In the realm of BASE jumping, these limits of performance occur at the boundaries of safety margins. This exponential increase in challenge, in order to achieve peak performance, may ultimately prove catastrophic. This is speculative and further research will be required to investigate this paradox. Schuler and Nakamura (2013) discovered an association between flow and risk taking. Flow was found to be correlated to low risk awareness and actual risky behaviour when self-efficacy beliefs were high. However, the link was only high for inexperienced individuals; flow and excessive high risk taking was not associated with experienced athletes.

(b). Chasing the thrill.

Findings

All the participant spoke about experiencing thrill to some extent and it encompassed a range of emotions: joy, delight, excitement, elation, euphoria, and so forth. It manifested itself in different ways - from quiet and personal satisfaction, to excited celebrations of euphoria with others after the jump. The desire to experience some form of thrill appeared to be an important part of the incentive to jump.

You are real scared at the exit point, then you jump, and when you land you're totally stoked. I can't wait to get up and do that again (Jumper N).

I honestly really think there's a drug element to it, you are feeling a fantastic high afterwards (Jumper H).

I feel a true sense of satisfaction looking back at the object and knowing I've jumped it (Jumper J).

There is nothing better than being able to share the jump with friends that have gone through the experience with you (Jumper D).

Participants reported escalating feelings of excitement and anticipation leading up to the jump. These positive emotions vacillated with negative emotions of anxiety and apprehension prior to the jump. Interestingly, none of the participants described experiencing any form of thrill at the moments just prior to jumping. Participants also failed to describe any form of thrill during the freefall part of the jump. Thrill only occurred again after their parachutes had deployed, and occurred initially in conjunction with a feeling of intense relief as their parachutes opened safely. The highest level of thrill was reported immediately after landing, a point which was described by jumpers as 'the stoke'. This was a period of extremely intense emotional highs, and a moment to celebrate with colleagues. Participants reported losing social inhibitions and shamelessly hugged and 'high-fived' each other. These emotions

then gradually tapered off as time passed to a more personal savouring experience of achievement and satisfaction.

A number of participants reported that the thrill from BASE jumping started to diminish over time and the only way to maintain a constant state of thrill from the sport was to increase the challenge on a jump.

Over time, what you used to get from doing one jump, you have to do three or four to kind of get the same feeling from it (Jumper P).

It was absolutely the most intense kind of happiness and exhilaration that perhaps I have experienced for the first 10 or 20 jumps, and then I noticed that I wasn't getting the absolute rush, like I wasn't getting the adrenalin as much anymore (Jumper F).

You have to do more challenging jumps to get the same buzz again (Jumper E).

I can't do a really simple, straightforward jump and get the same out of it that I would from a six second double front flip or a twelve second tracking jump at Lauterbrunnen (Jumper Q).

I rarely describe what I do as extreme because it's become very normalised for me (Jumper Q).

Discussion

Thrill occurred in a similar fashion to the saw-tooth effect of fear. Fear and thrill oscillated back and forth during the lead-up to the jump (Buckley, 2016). A strong incentive to BASE jump, according to participants, was a need to achieve some form of excitement or adrenaline rush. It is interesting then, that at the point of actually jumping, the experience of thrill was extremely low. It was only after the jump that thrill had the highest emotional impact. This is consistent with the emotional intensity that Hetland and Vittersø (2012) found to occur after a BASE jump and this suggests that the post-jump experience may play as an important emotional role as the actual activity itself. Reports of the experience of thrill prior to the jump

were also consistent with the findings of Buckley (2016). He found that individuals perceive thrill differently. Thrill can occur during and/or after an event. At low thresholds, thrill can occur without fear, but thrill cannot occur without fear at high thresholds. Fear appeared to increase thrill up to a point, where-upon thrill disappeared and only fear remained just before the jump. Thrill was also absent during the freefall stage of the activity, but re-emerge fairly strongly just after parachute deployment, and alternated with an experience of relief for some participants. After the jump, emotions flood back in the form of euphoria and triumph experiences. This is the period of the strongest thrill experience in BASE jumping.

Thrill is a strong motivator to BASE jump and this may be a potential threat for participants. Risk appraisal and perception may be compromised because the need to jump, in order to achieve a state of pleasure that the thrill experience delivers, may impact upon judgement and decision making. Buckley (2016) found that some rock climbers suffered from withdrawal states and displayed characteristics of behavioural addiction as a result of participation in a high risk activity. BASE jumping may have a similar addiction effect on some individuals, but this was not clearly evident from the study. It was not apparent from the data as to whether participants employed any specific coping skills to manage this, other than voicing the opinion that staying fearful moderates risk taking and protects them from complacency and overconfidence whilst jumping. This may also temper the amount of thrill that some individuals seek out on each jump. This notion that was addressed earlier on in the discussion of fear (see managing fear section).

The post-jump experience of thrill was reported to be profound. The experience was described as similar to that of a narcotic-induced experience. This may be explained by the powerful cocktail of neurotransmitters that are released during a high risk activity. Dopamine floods the nucleus accumbens – the reward and pleasure centre of the brain, which gives rise to an immediate post-experience of euphoria. Endorphins also produce an intense pleasurable feeling and serotonin creates a happy afterglow sensation (Netter, Hennig & Roed, 1996). Serotonin also fosters social bonding. Ryff (1995) says that one of the fundamental tenants of wellbeing is that of positive relationships with other people. The shared experience of danger creates unique bonds between participants, forged through a common language, shared responsibility, and a shared understanding of participating in high risk sport (Celsi, 1992). A shared experience of thrill, post-jump, was reported by participants as being an important aspect of BASE jumping.

Thrill poses a number of threats and may cloud judgement. Schwartz (2000) states that individuals in a happy mood tend to overestimate the likelihood of a positive outcome and underestimate the likelihood of a negative outcome. Paradoxically, the desire to experience thrill also appeared to give rise to risk acculturation amongst a number of participants. They reported that the experience of thrill became degraded over time, and after completing a number of BASE jumps. A tolerance to risk taking also occurred. Jumps that were once seen as dangerous, were gradually perceived as being routine and less risky. In order to continue to experience the same degree of thrill, participants began to increase the complexity of their jumps. In BASE jumping, an increase in complexity also entails an increase in danger. This risk taking trajectory is consistent with the findings of Hanson (1989) and Slovic (1987). Risk desensitisation occurs over a period of time. Celsi, Rose and Leigh (1993) found a similar effect. The initial exhilaration gives way to risk habituation and tolerance. Habituation also makes the positive processes and experiences weaker and a craving develops when the behaviour is no longer available. They found that more experienced skydivers attempted riskier and more complex jumps in order to experience the same level of thrill.

This suggests that over time, risk perception changes and a tolerance for risk develops – which may become problematic. Risk tolerance may lead to degraded risk perception, and this may encourage participants to take increasingly greater risks to achieve the same emotional rewards in the sport (Barlow et al., 2015). Individuals may be motivated to increase the complexity of their jumps in order to continue to experience the same emotional intensity. At some point though, as skill and ability reach their limits, catastrophic incidents may occur. The important issue is that BASE jumpers become aware of this potential hazard and take appropriate precautions. They may need to renegotiate their relationship with the need for thrill on each jump. This may keep the risks to a manageable level. Unfortunately, this research cannot definitively show that moderating thrill seeking will ensure safe outcomes at all times. The dangers in BASE jumping are multifarious, whilst for some jumpers, the thrill, risk and danger of the sport may be the primary drivers for participating. Without these factors, the sport may hold no attraction for them.

3.3. Negotiating the discord

(a). Guilt: The price of freedom

Findings

A number of participants spoke about feeling free as a BASE jumper.

Yeah, I'm free. That sounds funny but that's what it means to me. It's a freedom that nobody can take away from me. It's a moment where I'm not responsible for anybody else but myself. There's no other shit, it's just what it is (Jumper L).

I was living a very mediocre kind of existence and it felt like a really irrelevant sort of way to live. BASE jumping to me was an exciting sort of way to get away from all of that and feel like I was living a unique experience (Jumper I).

A number of participants spoke about their inability to free themselves from the guilt that BASE jumping imposes upon them. The price for being free to jump, comes at the cost of worry and concern that their friends and family have to bear. This creates a dilemma and is reflected by the need to rationalise their actions.

I'm very well aware of how selfish it is and I don't do it for anybody besides myself and the self-gratification in it. I know it's hard for my family to deal with what I do, but yeah, it keeps me sane (Jumper L).

The desire for freedom imposes an underlying state of tension – participants spoke of the powerful attraction that the sport holds for them, but at the same time this places immense pressure on their families, which in turn creates emotional dilemmas for participants. In order to resolve this dissonance, one participant tried to reframe how he engages with risk in the sport.

I've been very fortunate; my family has been very supportive of the time I spend in this sport. This kind of tells me in my mind, okay, my wife has given me enough

freedom. I should not be misusing it. I should not be doing sketchy jumps (Jumper I).

Jumper I still remained conflicted though. BASE jumping appeared to exert a powerful hold over him. He spoke about his passion to wingsuit BASE jump, but also recognised how dangerous it is, and how unfair it would be on his family if he pursued this yearning desire.

There's one thing that I want to do at least one time in my life and that is to wingsuit BASE jump – you have to take a risk to get up to that level, and then on the other side, I have this family and this whole emotional bonding thing – it tells me that you cannot take that risk to put them at risk...but I don't know, I still hope to wingsuit BASE once in my life (Jumper I).

Another participant echoes this dilemma:

I'm trying not to let things get away from me – from trying to go bigger, trying to go harder. I'm doing kind of vanilla jumps and they're beautiful – I'm flying. I'm getting out of it what I need and I don't need to push any harder. I think I keep xxx (his wife's) respect when I retain this kind of approach (Jumper F).

He goes on to express his surprise at finding out that the happiest day in his wife's life will be when he gives up BASE jumping. One of the participants had stopped BASE jumping and this afforded him the emotional space to reflect back upon his time in the sport.

It makes you very self-centred – that's the negative side of it. You become very, very focussed almost exclusively on the jumping. You are oblivious to those around you. You don't realise at the time, but your family and people who are in your life must take an absolute pounding, you know, they've got a lot to deal with all the time – and you're not there (Jumper G).

Discussion

The participants expressed a desire to achieve a state of freedom by engaging in BASE jumping. This is echoed by the findings of Yakutchik, (1995), Langseth (2011), and Brymer and Schweitzer (2013). Participation in extreme sport is both a compensation perspective – an escape from a modern constraining society; and an adaption perspective – an expression of individual freedom. It may be that the predictable and safety-conscious culture of modern Western society makes people feel trapped and extreme sport represents a means of both rebellion and escape from rules and restrictions in society. Extreme sport is a supplement for a sense of excitement and challenge that is missing in everyday life (Bower, 1995).

Paradoxically, the search for freedom in BASE jumping exists within a set of controls. The notion of freedom is expressed as an escape from societal control, yet in order to negotiate their sport safely, participants must develop a set of skills and knowledge, in order to control the risks in their environment. Control and freedom stand in opposition to each other, yet the need for control to stay safe in BASE jumping is a fundamental requirement. BASE jumping is not only a recreational activity; it is also a sub-culture of like-minded individuals. Langseth (2012) examined the culture of BASE jumping. It exists within a set of standards and ethics, and participants that breached this ‘unspoken code’ were subject to scrutiny and criticism from within the BASE jumping community. This suggests that even within extreme cultures that seek to divest themselves of societal constraints, the unspoken rules that govern these sub-cultures, impose a set of controls over those within the group. The notion of true and total freedom is an illusion.

The need to jump imposes an underlying state of guilt and this leads to indecision and uncertainty for individuals. This conflict creates cognitive dissonance: the mental discomfort experienced when an individual holds two or more contradictory beliefs, ideas or values; or when performing an action that contradicts these beliefs, ideas or values; or when being confronted by information that contradicts these beliefs, ideas or values (Festinger, 1957). The conflict and the guilt that ensues is a difficult emotional challenge to resolve. Some participants resolve their cognitive dissonance via a maladaptive defence mechanism: rationalising. This fallacy of reasoning occurs where controversial feelings or behaviours are justified in a seemingly rational manner to avoid the true explanation, and are thus made consciously tolerable. They feel conflicted by their need to jump, so justify this by

convincing themselves that they will only do 'safe' jumps. They expect that this form of compensatory behaviour will resolve the apprehension that their families experience, whilst failing to recognise the fundamental problem – that any form of BASE jumping is still dangerous and as long as they jump, their loved ones will worry about them.

BASE jumping exerts a powerful attraction to those who are drawn to this sport. The attraction appears so strong that it may blind some individuals to the emotional impact that their actions have on others. The need to jump for personal reward conflicts with the concern that loved ones must endure to tolerate their loved one's risk taking. Olivier (2006) investigated the moral dilemmas of participating in extreme sport. He believes that rational individuals have the right to autonomy but he concluded that individuals should be free to pursue high risk activities only if they recognise and concern themselves with the effects that their actions may have on others. He argues that the real experience of moral decision making requires the existence of human freedom. The answer to this dilemma is complex and no single, homogenous solution will resolve this tension. Each BASE jumper needs to negotiate his/her own path in the sport with regards to the emotional impact that their actions have upon their loved ones. It may be for some people though, that the only means of resolving this conflict is to stop jumping.

(b). Denial: The prospect of injury and death

Findings

I think that for me, being a BASE jumper means that I am willing to step out on that edge, and really try and find out what I am personally made of, and where my limits are, my boundaries, and where I'm able to push a little bit further than the average person (Jumper K).

A number of participants cited the motivation to BASE jump as a need to challenge themselves by facing their fears and finding new meaning in their lives. The sport may certainly deliver these rewards, but it may also come at a cost. Participants called this the 'dark side' of BASE jumping.

There's a very dark, cold reality to the warmth and excitement that comes with BASE. It can change very quickly from euphoria to waiting for the helicopter to come fly out a body (Jumper P).

Being seriously injured or killed is a definite reality of what can happen to anyone that chooses to BASE jump.

It's not a matter of if you go in when you do a lot of BASE, it's a matter of when. There's only one way to win in this game and that is to retire (Jumper F).

Participants discussed how they personally rationalised the risk of injury and death in the sport.

There was the getting injured part – broken ankles, twisted knees, broken backs. I accepted that in a way because I thought it's not going to happen to me because I know what I'm doing; which is not a realistic thought, but if you say it to yourself often enough and get confirmation from other's mistakes; you go – I'm never going to make that mistake, you see, I'm doing the right job here (Jumper C).

Participants maintained that it is important to acknowledge and accept the possibility of dying in the sport.

I accept that could be one of the outcomes and I'm easy with that. I'd rather it not happen now, but if it does, it does – you know... (Jumper N).

One participant went so far as to reframe the possibility of death in the sport as a positive aspect in his life.

The risk of possibly dying in BASE encourages me to live very day, to appreciate my life, to be grateful, to be present. This translates into other areas of my life (Jumper P).

Another participant's rationalisation to justify death in the sport was somewhat unusual.

It was a highly dangerous jump. It gave me a rush, like a massive rush, because I'd cheated death yet again. I beat it again. I got up and gave it (death) a big old slap in the mouth and said – up yours, it's not going to happen (Jumper O).

After a serious accident one participant came to understand that he had been using a process of denial to reframe and rationalise his risk taking.

Everybody thinks it won't happen to them. Most BASE jumpers have this kind of ignorance – you can die, and people die, but it's not going to happen to me. You know, it could, but deep down in your mind you 100 percent think it's not going to happen to you. I would say that I only jump jumps that are safe, but that's not the reality. The reality is you convince yourself that the jumps you're doing, you've got the skills for and they're safe (Jumper E).

It was interesting to learn that some jumpers thought that the idea of being severely disabled after a BASE jumping accident was considered worse than dying.

I've made peace with dying a long time ago – there are things worse than death. I could end up as a quadriplegic or a paraplegic – dying doesn't scare me (Jumper L).

I'm more worried about injuring myself badly; a broken neck or being paraplegic, or something like that; than actually dying because if it happens, it happens quickly (Jumper H).

A couple of times my wife has jokingly, you know, in a very jovial way, told me that – if you go in, just go in, you know, die. Don't break your bones and come back home and sit in a wheelchair or something... (Jumper I).

Discussion

A difficult tension exists in BASE jumping: The drive to keep jumping stands in opposition to the knowledge that this desire might result in a serious or even fatal accident. Most participants in the study had either been injured whilst jumping; had experienced a close call that could have been catastrophic; had lost friends to the sport; or had been witness to a fatality. These are extremely stressful events and it seems plausible that participants need to find ways of managing their stress. In her study of rescue-workers (Lois, 2005) says – “rescuers were able to maintain the illusion of control, despite the negative feelings they were left with after ‘failed’ rescues” (Lois, 2005, p. 147). Ferrell, Milovanovic, and Lyng (2001) maintain that BASE jumpers have paralleled Lois’s (2005) rescuers’ decision to neutralise their feelings in order to keep jumping, and to be able to cope with personal tragedy in the sport.

Laurendau (2006) and Langseth (2012) found similar results in their research of skydivers and BASE jumpers. Rationalisation was an important strategy to come to terms with traumatic events. They found that when an accident occurred, other jumpers embarked upon a process of ‘victim blaming’. They rationalised that the mishap could have been avoided if the victim had exercised better judgement; and as they do not behave in a similar manner themselves; they ought to be immune from what happened to the victim. This is the error of attribution. An accident is attributed to the victim when it happens to someone else, but is attributed to external causes when it happens to oneself. This self-serving bias is a form of denial and also an example of what Weinstein (1980) calls comparative optimism. This is the phenomena where individuals believe themselves less likely than their peers to experience an undesirable event, or more likely than their peers to experience a desirable event. This serves the purpose of redefining their feelings about accidents. The danger of this is that their perception of risk may create a false sense of security; and they are ignoring the fact that they themselves are fallible and not immune from making a mistake that can lead to an accident.

Le Breton (2000) maintains that extreme sport is a symbolic game that is played with Death: The true test of truth that emerges from playing on the edge is an elegant way of putting one’s life on par with Death, in order to steal some of its power. This symbolic game that is played with death gives meaning to the experience. This study found that a tension exists – the desire to jump, even in the face of the high injury and death statistical evidence, creates feelings of

unease, to the point that one participant reported simply ignoring the possibility of a fatal outcome. This is especially prevalent when participants have to consider how a disability or death would impact upon their loved ones. The indignity of severe disability outweighed the prospect of death. Given that a severe injury would have life-changing implications (personal, financial, physical, psychological and social) for a disabled participant and his/her family, this attitude is understandable. BASE jumping delivers rewards such as feelings of mastery and control, autonomy, a sense of empowerment and self-efficacy (Allman, Mittelstaedt, Martin & Goldenberg, 2009). Being confined to a wheel-chair threatens these experiences. Participants maintained that they had come to terms with the possibility of death in BASE jumping, but there was no evidence to suggest that BASE jumpers have to come to terms with an alternative outcome after an accident – that of severe disability. Denial appeared to be the only coping mechanism that participants use to deal with this possibility.

The question remains – do BASE jumpers willingly accept death as part of their sport? There was no evidence in the study to support this, although a few participants in the study were adamant that death was an accepted part of their engagement with the sport. There was a suggestion that the possibility of dying in BASE jumping may rest in the hands of fate. Giddens (1990) states that where a statistical probability of a particular risk is high, and the outcome may be extreme, the idea of fate is important in making sense of it. There was unfortunately no realistic way to answer this question, especially if this is considered in the context of an organism's natural protective and preservation instincts, which naturally goes against a willingness to forfeit life.

Yalom (2008) believes that the fear of death undermines our ability to live fulfilled lives. Perhaps, by embracing death, BASE jumpers may argue that they are able to live more meaningful and satisfied lives. Pain and Kerr (2004) have an alternate explanation for the perception of death in extreme sport. They believe that some extreme sports participants have developed a paratelic protective frame that gives individuals a feeling of safety, even when threat, risk and danger are part of their phenomenological field. The protective frame forms a 'psychological bubble' around the activity:

...we can say that a protective frame gives the individual a feeling of safety, even where the dangers and threats are part of the phenomenal field, and that this produces the paradox of danger-which-is-not-danger. The presence of the frame is concomitant

with the arousal-seeking state, and the possibility of experiencing one or another type of excitement or pleasurable high arousal (Apter, 1993, p.31).

According to Kerr (2007), the paratelic protective state influences the individual's perception of risk, resulting in an increased sense of safety and confidence in their ability to deal with dangerous situations. An extension of this protective frame may be that death, is not really death. The notion that BASE jumpers willingly accept that they may die in the pursuit of their sport may be a difficult idea for society to grasp. This is not unique to BASE jumping. For decades, mountaineers have been willing risking their lives in the Himalayas, climbing into the 'death zone' above 26000 feet, in the pursuit of a summit. Many have sacrificed their lives in the process. The evidence suggests that death in this realm is a strong possibility, but that knowledge does not prevent many climbers from seeking out the summit. The notion of an individual being willing to accept death for the sake of passion and adventure still perplexes society. This willingness to sacrifice oneself in the pursuit of a higher 'calling' may only exist only for those that have achieved the highest state of actualisation. Celsi (1992) and Brymer (2005) maintain that the true essence of extreme sport is the transformation of self and the transcendence to a higher order of actualisation. This is speculation though because very little is known about what drives individuals to risk 'all' for the sake of an experience. Future research is necessary to investigate this ideal of the 'sacrificial death' in extreme sport.

Conclusion

BASE jumping is a committing sport and this fosters intense and conflicting emotions for those involved in the sport. The study set out to explore the emotional experience of BASE jumping and the impact it has on those in the sport. BASE jumpers deal with a powerful range of emotions such as anxiety, uncertainty, fear, grief and euphoria. These intuitive emotions are also the predominant method by which humans evaluate risk. They impact upon cognitive evaluations such as judgement and decision making, and inform behaviour.

Participants spoke about a number of emotional rewards that the sport delivers: the empowering experience of managing fear, the experience of rush that flow and thrill fosters, the feeling of freedom, and post-jump emotional well-being. The sport also creates a number of difficult emotional paradoxes and tensions that BASE jumpers need to cope with. A number of insights emerged from the study:

1. The notion of fear itself as being a protective mechanism may be flawed. Over time, the experience of fear may become normalised and its function as a warning signal may be ignored. A certain amount of fear protects against complacency and over-confidence, so an element of fear is healthy, but more adaptive decision making mechanisms and skills may better serve the BASE jumper in the management of risk.
2. Jumpers ought to be aware of the perils of the rush experience. The neurochemicals associated with flow and thrill are addictive. Addiction leads to habituation and tolerance. In order to continually experience the same degree of thrill, the complexity of a jump has to be increased. This also ups the risk ante. The ability/challenge ratio that is fundamental to flow is finite and there is a point where this ratio becomes impossible to maintain. This is the point at which catastrophe may occur. BASE jumpers need to guard against this.
3. BASE jumping creates emotional tensions such as guilt and denial. The stress and worry that the sport places on loved ones, and the threat of injury or death in the sport are emotional challenges. Cognitive dissonance and comparative optimism appeared to be some of the methods that participants employed to engage with these issues. These are flawed coping

strategies. Using healthier coping styles may promote a better resolution of emotional discord for participants.

These insights are preliminary understandings of how emotions may impact decision making, judgement and risk perception in BASE jumping. These psychological factors may be at the heart of a number of accidents and fatalities in the sport. As the sport continues to grow, and more people are drawn to participate, injuries and fatalities are certain to increase. A greater understanding of the psychological processes that underpin BASE jumping may lead to better safety outcomes for the sport. These findings may also be relevant to other high risk sports. The airline industry has for many years recognised the impact of emotional states upon decision making and has developed a number of initiatives and training programmes under the umbrella of human factors (Wiener & Nagel, 1988). In a similar manner, it is envisioned that BASE jumping schools will recognise that human emotions and other psychological factors have an impact upon how individuals negotiate risk and/or safety behaviours in the sport, and that these psychological aspects may be incorporated into their future training programmes. Findings from this study may also be applicable to the adventure tourism industry.

The study had a number of limitations. It was challenging during the interview process to get participants to communicate their emotions to the researcher. Part of this may be due to retrospective recall, while another explanation may be that, according to Woodman, Hardy, Barlow and Le Scanff (2010), extreme sports participants find it difficult to identify and express their emotions to others. Retrospective reports tend to be flawed as they suffer from a number of memory biases (Schwarz, 2004). The memory for emotional experience is also unreliable. Emotions are a subjective experience and may depend on language use, context, culture and individual differences in prior emotional experience. There was also an absence of female participants in the study. Previous studies have found significant gender differences in the reported frequency and intensity of emotions (Brebner, 2003). The use of video during the interview would have enhanced the interview process. Without it, the researcher failed to capture facial expressions and body language, something which may have added to the post-interview analysis. Real-time interviewing and observation of participants at the jump sites would have added to the research process, although this was beyond the scope of the study. The use of brain activity mapping would have enhanced the research process by allowing for a measure of emotional intensity during a BASE jump. Participants in the study identified

camaraderie as a primary motivator for engaging in the sport. This suggests that emotions may play a dual impact on both the individual and the group in the sport. This was beyond the scope of the current study and future research is necessary to investigate this phenomenon.

The study has identified that powerful emotions such as fear, flow and thrill impact upon how BASE jumpers negotiate the sport. These emotions play an important role in risk appraisal and risk taking, whilst emotional discord influences how BASE jumpers cope with difficult aspects of the sport. Developing a greater understanding of the psychological factors that impact risk taking in BASE jumping may enhance safety and play a role in reducing future accidents in the sport.

References

Allman, T.L., Mittelstaedt, R.D., Martin, B., & Goldenberg, M. (2009). Exploring the motivations of BASE jumpers: Extreme sport enthusiasts. *Journal of Sport and Tourism, 14*, 229-247.

Anshel, M.H., Williams, L.R.T., & Williams, S.M. (2000). Coping style following acute stress in competitive sport. *Journal of Social Psychology, 140*, 751-773.

Apter, M.J. (1993). Phenomenological frames and the paradoxes of experience. In J.H. Kerr, S. Murgatroyd, & M.J. Apter (Eds), *Advances in reversal theory* (pp. 27-39). Amsterdam: Sweets & Zeitlinger.

Apter, M.J. (2001). *Motivational styles in everyday life: A guide to reversal theory*. Washington: American Psychological Association.

Barlow, M., Woodman, T., & Hardy, L. (2013). Great expectations: Different high-risk activities satisfy different motives. *Journal of Personality and Social Psychology, 105*, 458-475.

Barlow, M., Woodman, T., Chapman, C., Milton, M., Stone, D., Dodds, T., & Allen, B. (2015). Who takes risks in high-risk sport? The role of alexithymia. *Journal of Sport and Exercise Psychology, 37*, 83-96.

Baumeister, R.F., Vohs, K.D., DeWall, C.N., & Zhang, L. (2007). How emotions shape behaviour: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review, 11*, 167-203.

Ben-Zur, H., & Zeidner, M. (2009). Threat to life and risk taking behaviours: A review of empirical findings and explanatory models. *Personality and Social Psychology Review, 13*, 109-128.

Blinc Magazine. (2017) *BASE fatality statistics*. Retrieved from http://www.blincmagazine.com/forum/wiki/Fatality_Statistics

Bower, J. (1995). Going over the top (extreme sports). *Women's Sport and Fitness*, 17, 21-24.

Braun, V., & Clarke, V. (2000). Using Thematic Analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. London: Sage Publications.

Brebner, J. (2003). Gender and emotions. *Personality and Individual Differences*, 34, 387-394.

Breivik, G. (1999). *Empirical studies of risk sport*. Oslo, Norway: Idrettshogskole Institutt for Samfunnsfag.

Breivik, G. (2010). Trends in adventure sports in a post-modern society. *Sport in Society*, 13, 260-273.

Brymer, E. (2005). *Extreme dude! A phenomenological perspective on the extreme sport experience* (Doctoral Dissertation), University of Wollongong, New South Wales, Australia.

Brymer, E., & Oades, L.G. (2009). Extreme sports: a positive transformation in courage and humility. *Journal of Humanistic Psychology*, 49, 114-126.

Brymer, E., & Scheitzer, R. (2012). Extreme sports are good for your health: A phenomenological understanding of fear and anxiety in extreme sport. *Journal of Health Psychology*, 18, 477-487.

Buckley, R. (2012). Rush as a key motivation in skilled adventure tourism: Resolving the risk recreation paradox. *Tourism Management*, 33, 961-970.

- Buckley, R.C. (2016). Qualitative analysis of emotions: Fear and thrill. *Frontiers in Psychology, 7*, 1-13.
- Buckley, R.C. (2016). Commentary on: Addiction in extreme sports: An exploration of withdrawal states in rock climbers. *Journal of Behavioural Addictions, 5*, 557-558.
- Burke, S.M., & Orlick, T. (2003). Mental strategies of elite high altitude climbers: Overcoming adversity on Mount Everest. *Journal of Human Performance in Extreme Environments, 7*, 15-22.
- Castanier, C., Le Scanff, C., & Woodman, T. (2010). Who takes risks in high-risk sport? A typological personality approach. *Research Quarterly for Exercise and Sport, 8*, 478-484.
- Celsi, R.L. (1992). Transcendent benefits of high risk sports. *Advances in Consumer Research, 19*, 636-641.
- Celsi, R.L., Rose, R.L., & Leigh, T.W. (1993). An exploration of high-risk leisure consumption through skydiving. *The Journal of Consumer Research, 20*, 1-23.
- Cheron, E.J., & Ritchie, J.R.B. (1982). Leisure activities and perceived risk. *Journal of Leisure Research, 14*, 139-154.
- Creyer, E., Ross, W., & Evers (2003). Risky recreation: an exploration of factors influencing the likelihood of participation and the effects of the experience. *Leisure Studies, 22*, 239-253.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience*. New York: Harper and Row.
- Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*, 815-822.

Dale, G.A. (1996). Existential phenomenology: Emphasizing the experience of the athlete in sport psychology research. *The Sport Psychologist*, 10, 307-321.

Diehm, R. & Armatas, C. (2004). Surfing: An avenue for socially acceptable risk taking, satisfying needs for sensation seeking and experience seeking. *Personality and Individual Differences*, 36, 663-667.

Dietrich, A. (2003). Functional neuroanatomy of altered states of consciousness: The transient hypofrontality hypothesis. *Consciousness and Cognition*, 12, 231-256.

Dietrich, A. (2004). Neurocognitive mechanisms underlying the experience of flow. *Consciousness and Cognition*, 13, 746-761.

Eatough, V., & Smith, J.A. (2008). Interpretive phenomenological analysis. In C. Willig & W. Stainton-Rogers (eds.), *The Sage handbook of qualitative analysis* (pp. 179-194). London, UK: Sage.

Ekman, P. (1984). Expression and the nature of emotion. In K. Sheerer & P. Ekman (Eds.), *Approaches to emotion*. Hillsdale: Lawrence Erlbaum.

Ferrell, J., Milovanovic, D., & Lyng, S. (2001). Edgework, media practises, and the elongation of meaning: A theoretical ethnography of the Bridge Day event. *Theoretical Criminology*, 5, 177-202.

Festinger, L. (1957). *A theory of cognitive dissonance*. London: Tavistock.

Gray, J.A. (1987). *The psychology of fear and stress*. Cambridge: Cambridge University Press.

Germain, B. (2007). *Transcending fear: The doorway to freedom*. [Kindle version]. Retrieved from <http://TranscendingFear.com>

Giddens, A. (1990). *The consequences of modernity*. Stanford, CA: Stanford University Press.

- Goode, E. (1990). *Deviant Behaviour*. Englewood Cliffs, NJ: Prentice-Hall.
- Gould, D., Eklund, R.C., & Jackson, S.A. (1993). Coping strategies used by U.S. Olympic wrestlers. *Research Quarterly for Exercise and Sport*, *64*, 83-93.
- Hanson, S. (1989). Dimensions of risk. *Risk Analysis*, *9*, 107-112.
- Hetland, A., & Vittersø. (2012). The feelings of extreme risk: Exploring emotional quality and variability in skydiving and BASE jumping. *Journal of Sport Behaviour*, *35*, 154-180.
- Holloway, I., & Todres, L. (2003). The status of methods: flexibility, consistency and coherence. *Qualitative Research*, *3*, 345-357.
- Hymbaugh, K., & Garrett, J. (1974). Sensation seeking among skydivers. *Perception and Motivational Skills*, *38*, 118-126.
- Jackson, S.A. (1996). Toward a conceptual understanding of the flow experience in elite athletes. *Research Quarterly for Exercise and Sport*, *67*, 76-90.
- Kerr, J.H. (1997). *Motivation and emotion in sport*. Hove, England: Psychology Press.
- Kerr, J.H. (2007). Sudden withdrawal from skydiving: A case study informed by reversal theory's concept of protective frames. *Journal of Applied Sport Psychology*, *19*, 337-351.
- Kerry, D.S., & Armour, K.M. (2000). Sport sciences and the promise of phenomenology: Philosophy, method and insight. *Quest*, *52*, 1-17.
- Kotler, S. (2014). *The rise of Superman: Decoding the science of ultimate human performance*. London: Quercus Editions.
- Kotler, S., & Wheal, J. (2016). *Flow Genome Project – The Documentary*. Retrieved from <http://www.flowgenomeproject.com/about>

- Langseth, T. (2011). Risk sports – social constraints and cultural imperatives. *Sport in Society: Cultures, Commerce, Media, Politics*, 14, 629-644.
- Langseth, T. (2012). BASE jumping – Beyond the thrills. *European Journal for Sport and Society*, 9, 155-176.
- Laurendau, J. (2006). He didn't go in doing a skydive. *Sociological Perspective*, 49, 583-605.
- Laurendeau, J. (2008). 'Gendered risk regimes': a theoretical consideration of edgework and gender. *Sociology of Sport Journal*, 25, 293-209.
- Laurendau, J. (2011). "If you're reading this, it's because I've died": Masculinity and relational risk in BASE. *Sociology of Sport Journal*, 28, 404-420.
- Lawther, J. (2003). *Fear or boredom?* [Kindle edition]. Retrieved from <http://www.squawkpoint.com/2013/04/fear-o-boredom/>
- Le Brenton, D. (2000). Playing symbolically with Death in extreme sports. *Body and Society*, 6, 1-11.
- Llewellyn, J.D. (2003). *The Psychology of risk taking behaviour* (Unpublished PhD), University of Strathclyde, Scotland.
- Llewellyn, D.J., & Sanchez, X. (2008). Individual differences and risk taking in rock climbing. *Psychology of Sport and Exercise*, 9, 413-426.
- Loewenstein, G.F., Weber, E.U., Hsee, C.K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267-286.
- Lois, J. (2005). Gender and emotion management in the stages of edgework. In S. Lyng (Ed.), *Edgework: the sociology of risk-taking*, pp. 117-152. New York: Routledge.
- Lupton, D., & Tulloch, J. (2002). 'Life would be pretty dull without risk': voluntary risk-taking and its pleasures. *Health, Risk & Society*, 4, 113-124.

- Lyng, S.G. (2005). *Edgework: The sociology of risk taking*. New York: Routledge.
- Monasterio, E., Mulder, R., Frampton, C., & Mei-Dan, O. (2012). Personality characteristics of BASE jumpers. *Journal of Applied Sport Psychology, 24*, 391-400.
- Monasterio, E., Mei-Dan, O., Hackney, A.C., Lane, A.R., Zwir, I., Rozsa, S., & Cloninger, C.R. (2016). Stress reactivity and personality in extreme sport athletes: The psychobiology of BASE jumpers. *Physiology and Behaviour, 167*, 289-297.
- Mei-Dan, O., Carmont, M.R., & Monasterio, E. (2012). The epidemiology of severe and catastrophic injuries in BASE jumping. *Clinical Journal of Sports Medicine, 0*, 1-6.
- Mei-Dan, O., Monasterio, E., Carmont, M., & Westman, A. (2013). Fatalities in wingsuit BASE jumping. *Wilderness & Environmental Medicine, 24*, 321-327.
- Michel, G., Cazenave, N., Delpouve, C., Purper-Quakil, D., & LeScanff, C. (2009). Personality profiles and emotional function in extreme sports: An exploratory study among BASE jumpers. *Medical and Psychological Annual, 167*, 72-77.
- Netter, P., Hennig, J., & Roed, I.S. (1996). Serotonin and dopamine as mediators of sensation seeking behaviour. *Neuropsychobiology, 13*, 205
- Oatley, K. (1992). *Best laid schemes: The psychology of emotions*. New York: Cambridge University Press.
- Oatley, K., & Jenkins, J.M. (1996). *Understanding emotions*. Malden: Blackwell Publishing.
- Olivier, S. (2006). Moral dilemmas of participation in dangerous leisure activities. *Leisure Studies, 25*, 95-109.
- Orlick, T. (1996). The wheel of excellence. *Journal of Performance Education, 1*, 3-18.
- Pain, M., & Kerr, J.H. (2004). Extreme risk taker who wants to continue taking part in high risk sport after serious injury. *British Journal of Sports Medicine, 38*, 337-339.

- Pain, M.T.G., & Pain, M.A. (2005). Essay: risk taking in sport. *The Lancet*, 366, 33-34.
- Panksepp, J. (1998). *Affective Neuroscience: The foundations of human and animal emotions*. NY: Oxford University Press.
- Partington, S., Partington, E., & Olivier, S. (2009). The dark side of flow: A qualitative study of dependence in big wave surfing. *The Sport Psychologist*, 23, 170-185.
- Persson, M.L., Wasserman, D., Geijer, T., Frisch, A., Rockach, R., Michaelovsky, E. (2000). Dopamine D4 receptor gene polymorphism and personality traits in healthy volunteers. *European Archives of Psychiatry and Clinical Neuroscience*, 250, 203-206.
- Posner, J., Russel, J.A., & Peterson, B.S. (2005). The circumplex model of affect: An integrative approach to affective neuroscience, cognitive development, and psychopathology. *Development and Psychology*, 17, 715-734.
- Price, I.R., & Bundesen, C. (2005). Emotional changes in skydivers in relation to experience. *Personality and Individual Differences*, 38, 1203-1211.
- Revelle, W., & Loftus, D.A. (1992). *The implication of arousal effects for the study of affect and memory*. Hillsdale, England: Lawrence Erlbaum and Associates, Inc.
- Robinson, M.D., & Clore, G.L. (2002). Belief and feelings: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, 128, 934-960.
- Russel, J.A. (2003). Core affect and the psychological construction of emotion. *Psychological review*, 110, 145-172.
- Ryff, C.D. (1995). Psychological wellbeing in adult life. *Current Directions in Psychological Science*, 4, 99- 104.
- Schalling, D., Edman, G., & Osberg, J. (1983). Impulsive cognitive style and the inability to tolerate boredom. In M. Zuckerman (Eds.), *Biological bases of sensation seeking, impulsivity and anxiety*. Hillsdale, NJ: Erlbaum Publishing.

Schüler, J., & Nakamura, J. (2013). Does flow experience lead to risk? How and for whom. *Applied Psychology: Health and Well-being*, 5, 311-331.

Self, D.R., de Vries Henry, E., Findley, C.S., & Reilley, E. (2007). Thrill seeking: The type T personality and extreme sports. *International Journal of Sport Management and Marketing*, 2, 175-190.

Slinger, E., & Rudestam, K.E. (1997). Motivation and disinhibition in high risk sports: Sensation seeking and self-efficacy. *Journal of Research in Personality*, 31, 355-374.

Slovic, P. (1987). Perception of risk. *Science*, 236, 280-285.

Slovic, P. (2007). The affect heuristic. *European Journal of Operational Research*, 177, 1333-1352.

Slovic, P., Finucane, M.L., Peters, E., & MacGregor, D.G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk and rationality. *Risk Analysis*, 24, 311-322.

Stranger, M. (1999). The aesthetics of risk. *International Review for the Sociology of Sport*, 34, 265-276.

Schwartz, N. (2000). Emotion, cognition and decision making. *Cognition and Emotion*, 14, 433-440.

Schwarz, N. (2004). Retrospective and concurrent self-reports: The rationale for real-time data capture. In A. Stone, S.S. Shiffman, A. Alienza, & L. Nebeling (Eds.), *The science of real-time data capture: Self-reports in health research* (pp. 11-260. New York: Oxford University Press.

Touroutoglou A., Lindquist, K.A., Dickerson, B.C., & Barrett, L.F. (2015). Intrinsic connectivity in the human brain does not reveal networks for 'basic' emotions. *SCAN*, 10, 1257-1265.

Vittersø, J. (2013). Functional well-being: Happiness as feelings, evaluations and functioning. In I. Boniwell & S. David (Eds.), *The Oxford handbook of happiness*. Oxford, UK: Oxford University Press.

Weinstein, N.D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, *39*, 806-820.

Westman, A., Rosén, M., Berggren, P., & Björnstig, U. (2008). Parachuting from fixed objects: descriptive study of 106 fatal events in BASE jumping 1981 – 2006. *British Journal of Sports Medicine*, *42*, 431-436.

Woodman, T., Hardy, L., Barlow, M., & Le Scanff, C. (2010). Motives for participation in prolonged high-risk sports: An agentic emotion regulation perspective. *Psychology of Sport and Exercise*, *11*, 345-352.

Wiener, E.L., & Nagel, D.C. (1988). *Human factors in aviation*. Huston, Texas: Gulf Professional Publishing.

Willig, C. (2008). A phenomenological investigation of the experience of taking part in 'extreme sports'. *Journal of Health Psychology*, *13*, 690-702.

Wise, J. (2009). *Extreme fear: The science of your mind in danger*. New York: Palmgrave Macmillan.

Yakutchik, M. (1995). A grand lesson: For a first time mountaineer, life's limitations vanish into thin air. *Women's Sport and Fitness*, *17*, 82-83.

Yalom, I.D. (2008). *Staring at the sun: Overcoming the terror of death*. San Francisco, CA: Jossey-Bass.

Zuckermann, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, New Jersey: Erlbaum.

Zuckerman, M. (1994). *Behavioural expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press.

Zuckerman, M. (2002b). Genetics of sensation seeking. In J. Benjamin, R.P. Epstein & R.H. Belmaker (eds.), *Molecular genetics and the human personality* (pp. 193-210). Washington, DC: American Psychiatric Publishing.

Appendix - A



Date: 18 July 2016

Dear Anton Green

Re: Ethics Notification - **SOA 16/39 - New Application - An emotional exploration of BASE jumping.**

Thank you for the above application that was considered by the Massey University Human Ethics Committee: **Human Ethics Southern A Committee** at their meeting held on **Tuesday, 12 July, 2016.**

On behalf of the Committee I am pleased to advise you that the ethics of your application are approved.

Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely



Dr Brian Finch

Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

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Appendix - B

BASE JUMPING RESEARCH ADVERTISEMENT

Snake River BASE Academy Alumni Facebook closed group advertisement:

Hi

My name is Anton Green and I learnt to BASE jump at Snake River BASE Academy a few years ago. I'm undertaking a research project that forms part of my Masters in Psychology and I'd like to invite current BASE jumpers to take part in an interview about the sport. I'm looking for jumpers with at least 10 jumps and 3 months in the sport. The research is about the experience of being a BASE jumper and what it's like to participate in the sport. You'll need to participate in a 60-minute interview with me, either in-person, or by telephone or Skype. If you are interested in participating, please e-mail me at debantgreen@yahoo.com and I will send you an information sheet about the research, a consent form to sign and a short questionnaire about your BASE experience. The consent form and questionnaire can be e-mailed back to me before the interview. I'll also contact you to arrange a suitable time for you to participate in my research interview.

NZ BASE Facebook closed group advertisement:

Hi

My name is Anton Green and I learnt to BASE jump at Snake River BASE Academy a few years ago. I'm undertaking a research project that forms part of my Masters in Psychology and I'd like to invite current BASE jumpers to take part in an interview about the sport. I'm looking for jumpers with at least 10 jumps and 3 months in the sport. The research is about the experience of being a BASE jumper and what it's like to participate in the sport. You'll need to participate in a 60-minute interview with me, either in-person, or by telephone or Skype. If you are interested in participating, please e-mail me at debantgreen@yahoo.com and I will send you an information sheet about the research, a consent form to sign and a short questionnaire about your BASE experience. The consent form and questionnaire can be

e-mailed back to me before the interview. I'll also contact you to arrange a suitable time for you to participate in my research interview.