Utilizing the Perception of Risk to Enhance Incident Prevention Strategies

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The Nature of Risk

Managing risk would be a whole lot easier if the existence and extent of risk could be accurately defined. However in complex natural systems, it is difficult to identify all the variables and how they interact. Things get more complicated when people are introduced to the equation. It is not always clear how people will react to risk and how their behaviour will affect the outcomes. Risk can mean different things to different people. Definitions of risk tend to revolve around the probability and severity of unwanted or undesirable consequences.[1] However, people will have different views as to what is unwanted and undesirable, the severity of outcome and how you calculate probability. On one hand, some seek out extreme situations; to others such behaviour is incomprehensible. When things get complex some stay calm and focused, for others, fear overwhelms and is dehabilitating. This interaction of people and the environment can result in simple scenarios spiralling to disaster.

The risk management process involves a number of key elements. In simple terms they include;

• Identifying what could go wrong
• Establishing what could be the consequences if things go wrong and how serious they would be
• Estimating the likelihood of occurrence
• Reducing the chance of things going wrong
• Reducing the consequences and seriousness of outcomes
• If things go wrong stopping them getting worse
• Getting things back on course
• Learning from the experience and feeding this back into all the previous stages.

Fundamental to the risk management process is the way risk is perceived. Our background, training, experience and group attachments and motivation for participation may act as a framework that influences the way we deal with risk. Aronson[2] has put forward the view that "People who do crazy things are not necessarily crazy." Understanding the participant's perspective is a key component to risk management and incident prevention strategies.

One of the first things to recognise is that engaging with risk often provides us with benefits.[3-11] People will seek out risks in wilderness and adventure activities for a range of reasons including, excitement, personal development, challenge, opportunities to exert control, escape, freedom, affirmation of the self, self empowerment, fulfilment of social needs, social approval and "contact with a higher power". A number of researchers have argued that there is variation in our personality and predisposition to risk.[12-16] As a consequence, some people seek out sensation through thrill and adventure and this may influences the activities undertaken.[17,18] Lyng[19] suggests that risk taking may be necessary for the wellbeing of some people.

The view has been expressed that risk sets us challenges and dealing with risk is part of being a human being.[20] Coffey[21] believes that those who operate at the extremes of human ability are important to society. When looking at the personal costs of climbing, she says "The world needs risk takers. They inspire, challenge and encourage. They set off sparks, igniting fires that burn long after their passing."

So it can be seen that people may want different things from adventure and wilderness activities. For some, the way in which the encounter takes place is of high importance and right up there with the encounter itself. The detailed planning of the activity, the acquisition of appropriate knowledge and skills and self sufficiency, contribute to the richness of the experience. The process becomes part of the outcome. For others, this process may present an unacceptable drain on time and resources, so a more attractive option may be to delegate this to others who are perceived to be competent.

If, as Ewart[5] notes, excitement and challenge are some of the reasons to seek out risk, excessive control through rules and regulation and pacification of the risk may actually conflict with the very reasons for participation. This presents the challenge of maintaining the essence of the activities whilst boosting safety. Delle Fave et al [6] say that this can be achieved not by just getting rid of the risk but matching risk with ability. So instead or taming the wilderness we should look to enhance participants' capacity to understand the nature of risk and support the development appropriate coping strategies.

Being a parent brings into focus some of some of the dilemmas associated with risk. On one hand you will want your child to get out there enjoy life, learn about themselves and the world, develop skills and encounter

and manage risk. On the other hand, you are fearful of the consequences of things going wrong. At the age of 11 my son developed an interest in skateboarding. I knew that if he pursued this he would fall, he would defiantly get cuts and bruises and he could break bones or worse. As someone working in the field of health and safety, perhaps I should have discouraged or prevented him from using his board. I could have purchased a load of impact absorbing foam and wrapped him in it whenever he went out, I could have laid down rules preventing him from performing certain moves. The reality is that I believe that overprotecting him is not in his interest. By taking risk he is developing his ability to manage risk; he is getting exercise and is learning to control his body. Through the development of skills, his self-esteem has been boosted; he has become more independent and has developed new friendships. All this is very subjective and based upon my assessment of the costs and benefits of risk. An outsider looking at the injuries associated with skateboarding may view it as an activity that should be banned and see me as irresponsible father. This illustrates how different people looking at risk will have different interpretations. We may not be aware of how individuals and groups view risk and how it fits into their lives. When developing risk management strategies, there is a need to gain an insight into the context of risk and risk taking behaviour.

The perception of risk may result in risks being misjudged.[22] A range of factors have been identified that influence this perception. These include who is affected, whether the risk is undertaken voluntarily, whether we control the risk, how familiar we are with the risk, the costs and benefits, whether the consequences are reversible and whether we think we are susceptible to the risk.[1]

This chapter aims to provide an overview of a range of factors influencing the perception of risk and risk taking behaviours.

Attitudes Values and Beliefs

Whether or not information supports or goes against what is believed can bias our perception of risk.[23] The presentation of information that goes against our attitudes can make us feel uncomfortable (cognitive dissonance). To get rid of this uncomfortable feeling we can adopt a number of strategies. These include taking on board the new information and modifying our attitudes and behavior accordingly, avoidance and denial and the downplaying or reinterpretation of information we don't want to hear. Alhakami and Slovic[24] suggest that if an activity is liked, the benefits are judged to be high and the risks low. If an activity is disliked, the benefits would be perceived as low and the risk high. I sea kayak, looking at the literature on injuries associated with kayaking, the evidence suggests that I may well develop lower back and joint and tendon problems. However, I really enjoy the activity, so I justify it in terms of cardiovascular fitness, it being a wonderful de-stressor and a great way of boosting my well being. Our interpretation of information both supports and influences our perception of risk.

The Reporting of Risk

Events that jump to mind are rated as more likely than events that are less mentally available, particularly if you have direct experienced them.[23] Reporting by institutions such as the mass media can result in the 'social amplification of risk.[25] In such a way, rare and dramatic events may become the focus of television and newspapers and those headlines can influence the perception and response to risk of both individuals and regulatory bodies. Less dramatic but frequent events are often not news worthy. This lack of media attention may result in an underestimation of risk. The mass media in one part of the world will report on a surfer killed by a shark in another continent, however the more common injuries and medical conditions experienced by thousands of participants does not command the same level of coverage.

The Reinforcement of Behaviour and Attitudes

The rewarding of behaviour (positive reinforcement) or the removal of an adverse stimuli (negative reinforcement) can increase the likelihood of response.[26] These Behavioural Theory concepts have been used to explain aspects of risk taking behaviour. Each time an incident does not occur, the avoidance of the inconvenience and discomfort of preventative and precautionary action may reinforce behaviour.[27] Thus incident free activities may result in a failure to take preventative action. Furthermore, discomfort and inconvenience may figure in the analysis of the costs and benefits associated with the adoption of preventative behaviour and safety equipment.[28] So, if through direct experience things don't seem to go wrong and the preventative action being taken gets in the way of the activity, there may be a tendency to abandoned precaution. This may help explain why many boaters who drown are found not to be wearing personal flotation devices.[29]

The concepts associated with reinforcing behaviour can be applied to positive safety behaviour. The wearing of personal protective equipment can be perceived as valued even when it is not a legal requirement. It may be the case that such equipment adds to the experience and allows for the participant to encounter more challenging and desired experiences, thus its adoption is reinforced. Additionally, the wearing of such equipment may define the individual as a committed member of the subgroup or someone likely to embark on high-risk activities and therefore requiring additional safety measures. As a consequence, safety behaviour may be reinforced as it is subject to social approval and meets esteem needs. This is an example of

how steps to reduce or mitigate risk may actually enhance the experiences associated with voluntary risk taking.

Optimism Bias

Individuals may perceive that the level of risk is lower for them than it is for others in the same situation and so believe that it may happen to others but not to them. Seifert (quoted by Coffe[21]) is of the view that in relation to mountaineering and expeditions, participants recognise that terrible things can happen to people. These events are seen to be due to bad luck or mistakes and will not happen to them.

This may have a direct influence upon the decision to engage with a risk. Weinstein[30] points out that 'optimistic biases' exist for a wide range of health and safety risks and that these biases are strong for hazards that are regarded as personally controllable, rated as low probability and with which people have little personal experience. Additionally, Weinstein suggests that biases are likely to be large when people believe that signs of vulnerability will appear early and therefore, the absence of signs of vulnerability is interpreted by them being exempt from future risk. Things not going wrong to date may be regarded as things will not go wrong in the future.

Optimism about successful behaviour may encourage action, which in turn leads to success. The illusion of control is seen to be more likely to occur amongst participants with less experience, who have not encountered the full array of possibilities and therefore may be caught out by the severity of conditions. Males and young people in general are viewed as being particularly susceptible to this illusion and so extreme activity may appear less threatening. Extreme performers may be encountering the right mix of skill and chance that maintains the illusion of controlling the uncontrollable. Belief in one's ability helps the individual to maintain control of themselves in the face of chaos, this may result in success and so perpetuates the illusion.[19]

The Role of the Group

Our membership of cultures, social networks and groups influence the way in which we regard and respond to risk.[20,31,32] Wanting to be accepted by the group or pressure exerted by the group may impact on risk taking behaviour. Within groups, risk may be valued and the beliefs about risk shared. As time passes there can be conformity to the norm of risk and the increase in risky behaviour is a way of expressing that norm. In addition to this, group polarisation may occur whereby a moderate attitude shifts to a more polarised attitude in the presence of others.[9, 10]

Processes such as training, formal teaching, informal story telling, reinforcement through the social world linked to the activity and direct experience, support the development of particular knowledge relating to and attitudes towards risk.[33] Initiates become socialised to a particular view of risk associated with the activity. Overtime, high-risk activities that may initially be regarded as extreme come to be viewed as the norm.

Celsi et al.[9] describe how a sense of community and camaraderie can occur where individuals have a common bond of experience that all perceive as being of particular importance. Thus participation in high-risk activities can fulfil social needs and forms a bond between individuals and a bond with the rituals of the experience and symbols and language of cultural membership.

Albert[34] proposes that the retelling of stories about activities and events influences the perception of risk and the occurrence of injury so that they are constructed as everyday expected elements of the activity. Through such mechanisms, participants come to view risk as a salient part of the activity and conversational practices normalise its occurrence and so diffusing it as a deterrent to continued participation. These processes may contribute to risk taking being valued. The potentially threatening character of danger is neutralised and the significance of losses downplayed. Injury and losses can be a way of demonstrating commitment to the activity and act as a right of passage and affirms membership. Webster (quoted by Coffe[21]) states "No one wants to get badly frost bitten, but to mountaineers it's a badge of honour." What may be perceived as a lack of concern of others to a participant's injury may actually be a re-affirmation by the group of the injured person's status as a participant who will get back into the sport as soon as possible. Albert[34] suggests that "far from being an inconvenient—even peripheral—element in sport, danger and risk-taking might be better understood as constitutive of participation in the first place."

In relation to those operating at the extreme level of performance, Lyng[19] states that injury and death due to poor planning and lack of standard safety precautions is not viewed well. This may result in social pressure to adhere to what may be collectively regarded as good practice. This is an example of the positive impact of social pressure on safety behavior. Conversely, Taylor et al.[28] indicate that social pressure and issues of image can act as barriers to the use of protective equipment.

Group processes and social influence can be seen to impact upon the perception of risk, risk taking behaviour and the nature of control strategies adopted. The utilisation of such factors may prove to be an effective means of ensuring compliance with 'good practice.' The use of personal flotation devices (PFD) by kayakers in Wales illustrates this point. Unlike some countries, it is not a legal requirement in the UK for kayak paddlers to carry or wear a PFD. Equally there does not appear to be any high profile cam-

paign to encourage PFD use. Regardless of this, the wearing of a PFD by kayakers is the norm. Enforcement and education campaigns are often used as primary approaches in safety initiatives, however in relation to kayaking in the UK, the adoption of safety behaviour may be more closely associated with socialisation processes and social pressure stemming from club and group membership.

Risk Compensation/Risk Homeostasis

The Risk Compensation Model/Risk Homeostasis Theory described by Wilde[35] and modified by Adams,[36] proposes that everyone has a propensity to take risk and this varies between people. We all have our optimal target level of risk. In simple terms, the model/theory suggests that adjustments occur in risk taking behaviour if it perceived that there is movement away from the target level of risk. This could be regarded as a risk thermostat. If the risk is too high we turn down "the heat" if it is not hot enough, we put "fuel on the fire."

Adams argues that people have a need for excitement or arousal. As a result of this, he feels that initiatives designed to reduce risk may not result in an overall reduction in losses as risk is displaced to another arena. So if we have an optimal level of risk and something comes along that reduces or increases that level of risk, we may take steps to get back to where we want to be. A few years ago I bought a car with anti-lock brakes. This safety feature resulted in me leaving my breaking until later and not slowing so much when approaching road junctions. This became apparent when I retuned to a car with conventional brakes. Over the next few days my heart missed quite a few beats and I left black tyre marks on many a road. My driving behaviour was adapted quickly to get me back to my target level of risk. A similar situation may occur in relation to wilderness and adventure activities. The use of global positioning systems to aid navigation may not necessarily reduce the numbers of people getting into difficulties. The confidence that such equipment provides may result in more people venturing to remote areas and going out in poor visibility. Safety equipment and good skills needs to be seen as something that compliments good practice and not a substitute for poor planning, behavior and judgement.

Hedlund[37] in a review of risk compensation draws attention to three injury prevention strategies:

• Persuade persons at risk to change their behaviour
• Require behaviour change by law or administrative rule
• Provide automatic protection through product and environmental design.

He points out that the Risk Compensation Model/Risk Homeostasis Theory, challenges the foundations of injury prevention strategies as it takes the stance that the only effective safety measures are those that alter desired risk level. Consequently, to modify the environment or regulate behaviour without altering target risk, is seen to be of limited value.

In his appraisal of the Risk Compensation Model/Risk Homeostasis Theory, Hedlund points out that behavioural adaptation and risk compensation occurs in some situations, however, evidence shows that safety law and regulation is not necessarily counter balanced by compensating behaviour. He argues that the issue is not whether compensation occurs, but when and by how much is it likely to occur.

Normalization of Risk

Over time, risk may become normalised and participants learn to accept risk as a high risk identity is developed.[9] Anxiety associated with the stages of the activity is seen to vary with experience. Celsi et al.[9] note novice skydivers found the jumping out of the aircraft discomforting, whilst experienced skydivers were seen to be anxious during the take off and ascent of the plane. For experienced skydivers, this may be linked with the perceived lack of control experienced during this stage of the activity.

As experience increases, concerns over potential negative consequences decreases. As people get more used to the risk, the risky activity becomes more enjoyable. These findings were reflected in the work of Creyer et al.[7] In relation to risky recreational activities, they report that as experience increases, perceived risks associated with the activity diminish and expectations for positive emotional outcomes increase. As this occurs, many participants engage in increasingly dangerous behaviours.

Over time, individuals may become desensitised to a situation. This issue is highlighted in Holyfield's[38] investigation into the emotional components of novice's consumption of adventure experiences. Holyfield describes the fear, emotions and physical impact of the experience of falling out of a whitewater raft and being caught in a hydraulic. An experienced rafter reviewing the description of the incident commented on how those with experience are often unaware of, or have forgotten, how situations appear to those with limited experience. He noted that coming out of rafts is so commonplace; there is a tendency to forget the impact they can have on the individual. This scenario highlights the presence of differential perception of risk. What may appear exciting and extreme to the novice may be regarded as mundane and routine to the experienced participant. It is easy to forget how frightening things can be to the new initiate.

Implications for Incident Prevention Strategies

Adventure activities can and do present risk to participants, however engagement can provide a range of benefits. The challenge is to reduce the likelihood of harm in

a way that is relevant and valued and at least maintains and if possible, increases positive benefits and the fulfillment of motives for participation.

If the motives for participation vary between people and according to experience and skill level, blanket approaches to the management of risk may be inappropriate. A controlled environment with failsafe back up systems may be welcomed by the novice and may allow the acquisition of high-level skills. To the experienced participant, such measures may negate the reasons for participation and may result in the introduction of alternative behaviours to reintroduce opportunities for the achievement of desired outcomes. Safety initiatives need to be sensitive to the differential skills, knowledge and aspirations of participants and not focus upon the elimination of risk in isolation to these issues.

Research into the perception of risk and the influence on risk taking behaviour has highlighted the complexity of people's response to risk. The perception of risk is not purely linked to statistical probability, magnitude and severity of outcome, but is influenced by a range of qualitative factors such as familiarity, controllability, whether the undertaking of the activity is voluntary and the perception of costs and benefits. Prevention strategies need to be mindful that from the perspective of participants, risk-taking behaviour may be regarded rational, justifiable and linked to a range of perceived benefits. The insights of participants may provide invaluable information in relation to risks and the suitability of prevention strategies.

Risk taking behavior may be rewarded through factors such as social approval and enhanced esteem; risk avoidance behavior may result in negative consequences such as inconvenience and discomfort. There is a need to address the balance of these factors. One approach is through the development of safety equipment and skills that increase the likelihood of desired outcomes. This may be complemented by the acquisition of such skills and equipment being seen to be a desired goal. If non-occurrence of incidents reinforces risk taking behavior and if preventative action is linked to the perception of likelihood of being involved in an incident, the provision of appropriate and credible information relating to frequency and severity of occurrence may be of value.

Group processes can be a powerful determinant of risk taking and risk mitigation behavior. The socialization of participants into the culture of an activity provides opportunities for the development of skills, knowledge and attitudes that support the effective management of risk. There is a need to promote the idea that to assess risk and to be able to effectively manage risk in a dynamic environment adds to the experience and is something that is respected and valued. Social pressure may be a more powerful determinant of safety behavior than legislation, particularly in environments where enforcement is difficult. In some activities, issues of image and social acceptability may make participants resistant to adopting safety practices. In relation to image, consideration needs to be given to ways in which the adoption of good practice and safety equipment comes to represent the fact the individual is a "hard core" committed participant and operates at a level where such equipment is necessary.

The attitudes and beliefs associated with the perception of risk may act as a filter to risk information. Information that goes against attitudes and beliefs may be downplayed; greater emphasis may be placed upon information that supports a chosen response to risk. To reduce the likelihood of the rejection of safety initiatives, this attitudinal framework needs to be recognized and where possible accommodated.

The assessment of costs and benefits and the likelihood of their manifestation influence target risk. If risk is perceived to be above or below the target level of risk, behavior may change to restore equilibrium. Information can usefully be provided to inform decisions relating to this cost benefit analysis. However, mechanisms may come into play that can result in an individual ignoring or discrediting information. For example, there may be a tendency to underestimate the likelihood of encountering losses. This could be particularly strong where an activity is undertaken voluntarily and problems have not been encountered. To provide information that is seen to be relevant to the participant, emanates from a credible source, and represents the situations they encounter may be a means of influencing optimism bias and target risk.

Conclusion

Different groups in society view and respond to risks in different ways. These differences reflect cultural context and values, group processes, experience and skill levels, individual differences and motives. In real world situations, there may be interplay of these factors and their relative strength can vary from person to person and situation to situation. Being aware of these factors provides an insight into attitudes and behaviour and can help in the identification of issues that need to be considered in risk management strategies.

Perceptions of risk that do not concur with those of socially defined experts are not necessarily wrong; they may be building different factors into the risk equation. These differential perceptions can provide invaluable information for the assessment of risk and the development of mitigation strategies that are relevant and acceptable (or even desirable) to those involved in risk taking activities.

Unless sensitive to the way in which people view risk

and what they desire from engaging with wilderness and adventure activities, well-intentioned safety initiatives may lack credibility and be rejected.

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References

1. The Royal Society. (1982). *Risk Analysis, Perception & Management.* London: The Royal Society.
2. Aronson, E. (1999). *The Social Anima*l (8th Edition). New York; W.H. Freeman & Co
3. Lester, J. (2004). Spirit Identity and Self in Mountaineering. *Journal of Humanistic Psychology*, 44, 1:86-100.
4. McIntyre, M. (1992). Involvement in Risk Recreation: A Comparison of Objective and Subjective Measures of Engagement. *Journal of Leisure Research*, 24, 1:64-71.
5. Ewart, A.W. (1994). Playing the Edge: Motivation and Risk Taking in a High Altitude Wilderness-like Environment. *Environment and Behaviour,* 26, 1:3-24.
6. Delle Fave, A., Bassi, M., & Massimini, F. (2003). Quality of Experience and Risk Perception in High Altitude Rock Climbing. *Journal of Applied Sport Psychology,* 15:82-98.
7. Creyer, E.H., Ross, W.T., & Evers, D. (2003). Risky Recreation: An Exploration of Factors Influencing the Likelihood of Participation and the Effects of Experience. *Leisure Studies*, 22:239-253.
8. Stranger, M. (1999). The Aesthetics of Risk: A Study of Surfing. International Review for the Sociology of Sport, 34, 3:265-276.
9. Celsi, R.L., Rose, R.L., & Leigh, T.W. (1993). An Exploration of High-Risk Leisure Consumption through Skydiving. *Journal of Consumer Research,* 20:1-23.
10. Rutter, D.R., Quine, L., & Albery, I.P. (1998). Perceptions of Risk in Motorcyclists: Unrealistic Optimism, Relative Realism and Predictions of Behaviour. B*ritish Journal of Psychology*, 89:681-696.
11. Le Breton, D. (2000). Playing Symbolically with Death in Extreme Sports. *Body and Society,* 6, 1:1-11.
12. Stelmack, R.M. (2004). *On Personality and Arousal: A Historical Perspective on Eyzenck and Zuckerman.* In Stelmack RM (Ed) On the Psychobiology of Personality. London: Elsiver.
13. Angleitner, A., Riemann, R., & Spinath, F.M. (2004). *Investigating the ZKPQ-III-R: Psychometric Properties, Relations to the Five Factor Model, and Genetic and Environmental Influences on its Scales and Facets.* In Stelmack RM (Ed) On the Psychobiology of Personality. London: Elsiver.
14. Netter, P. (2004). Personality and Hormones. In Stelmack RM (Ed) *On the Psychobiology of Personality*. London: Elsiver.
15. Zuckerman, M. (2000). Are You a Risk Taker? *Psychology Today*, 33, 6:52-6.
16. Zuckerman, M. (2004). The Shaping of Personality: Genes, Environment, and Chance Encounters. *Journal of Personality Assessment,* 82, 1:11-22.
17. Goma-i-Freixanet, M. Sensation (2004). *Seeking and Participation in Physical Risk Sports.* In Stelmack, R.M. (Ed), *On the Psychobiology of Personality*. London: Elsiver
18. Furnham, A. (2004). Personality and Leisure Activity: Sensation Seeking and Spare-Time Activity. In Stelmack, R.M. (Ed), *On the Psychobiology of Personality.* London: Elsiver.
19. Lyng, S. (1990). Edgework: A Social Psychological Analysis of Voluntary Risk Taking. *American Journal of Sociology*, 95, 4:851-886.
20. Lupton, D. & Tulloch, J. (2002). Risk is Part of Your Life': Risk Epistemologies among a Group of Australians. *Sociology*, 36, 2:317-334.
21. Coffey, M. (2003). *Where the Mountain Casts its Shadow: The Personal Costs of Climbing.* London: Arrow Books.
22. Slovic, P. (1987). Perception of Risk. *Science*, 236:280-285.
23. Renn, O. (1998). Three Decades of Risk Research. *Journal of Risk Research*, 1, 1:48-71.
24. Alhakami, A.S. & Slovic, P. (1994). A Psychological Study of the Inverse Relationship Between Perceived Risk and Perceived Benefit. *Risk Analysis*, 14, 6:1085-1096.
25. Kasperson, R.E., et al. (1988). The Social Amplification of Risk: A Conceptual Framework. *Risk Analysis,* 8, 2:177-187.
26. Skinner, B.F. (1953). *Science and Human Behavior.* New York: The Free Press
27. Slovic, P., Fischhoff, B., & Lichtenstein, S. (1978). Accident Probabilities and Seat Belt Usage: A Psychological Perspective. *Accident Analysis and Prevention*, 10:281-285.
28. Taylor, D.M., Bennett, D., Carter, M., Garewal, D., & Finch, C. (2005). Perceptions of Surfboard Riders Regarding the Need for Protective Gear. *Wilderness and Environmental Medicine*, 16:75-80.
29. American Canoe Association. (2004). Critical Judgement II: *Understanding and Preventing Canoe and Kayak Fatalities 1996-2002.* Springfield: American Canoe Association.
30. Weinstein, N.D. (1989). Optimistic Bias About Personal Risks. *Science*, 246, 8:1232-1233.
31. Scherer, C.W. & Cho, H. (2003). A Social Network Contagion Theory of Risk Perception. *Risk Analysis*, 23, 2:261-267.
32. Joffe, H. (2003). Risk: From Perception to Social Representation. *British Journal of Social Psychology*, 42:55-73.
33. Natalier, K. (2001). Motorcyclists' Interpretations of Risk and Hazard. *Journal of Sociology*, The Australian Sociological Association, 37, 1:65-80.
34. Albert, E. (1999). Dealing With Danger. *International Review for the Sociology of Sport,* 34, 2:157-171.
35. Wilde, G.J.S. (2002). Does Risk Homeostasis Have Implications for Road Safety. *British Medical Journal*, 324:1149-1152.
36. Adams, J. (1995). *Risk*. London: UCL Press.
37. Hedlund, J. (2000). Risky Business: Safety Regulations, Risk Compensation, and Individual Behaviour. *Injury Prevention*, 6:82-89.
38. Holyfield, L. (1999). Manufacturing Adventure: The Buying and Selling of Emotions. *Journal of Contemporary Ethnography*, 28;1:3-32.