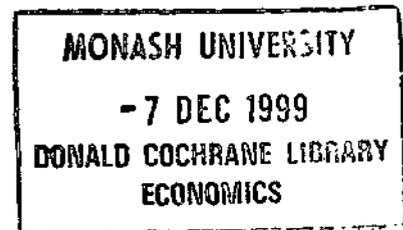


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**SAFETY AND THE ADVENTURE TOURISM
PROCESS: IMPLICATIONS FOR RESEARCH
AND RECOMMENDATIONS FOR THE
ADVENTURE TOURISM INDUSTRY**

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ABSTRACT

Close calls, mishaps and accidents in structured adventure tourism activities will cause harm to participants directly involved, the reputation of the activity's operator, and will potentially have negative consequences for the wider tourism industry. This paper reviews reasons why tourists participate in adventurous activities, how they perceive risk and the role of the activity operator. Following this, a model describing participants' conditions of adventure based on the interaction between their perception of fear of physical hazards and control is proposed. This model is then integrated into a framework that delineates the adventure tourism process. Based on this framework, a number of research areas are suggested to facilitate a greater understanding of accident causation in the adventure tourism industry.

SAFETY AND THE ADVENTURE TOURISM PROCESS: IMPLICATIONS FOR RESEARCH AND RECOMMENDATIONS FOR THE ADVENTURE TOURISM INDUSTRY

INTRODUCTION

The New Zealand Tourism Board (1996a) promotes New Zealand overseas through images that include fresh, clear waters and majestic scenery. This is not surprising given New Zealand's abundance of natural scenic attractions. This abundance contributes to a competitive advantage for New Zealand's tourism industry over other destinations. Market research by the New Zealand Tourism Board (1996b) indicates that a large proportion of visitors to New Zealand is seeking adventurous activities typically found in these natural environments. This demand has resulted in tourism operators providing an increasing range of environment-based adventure tourism activities such as hunting, mountain bike riding and skiing (Ministry of Tourism, 1992).

ADVENTURE-BASED TOURISM, TOURISTS' EXPERIENCES AND ACCIDENTS

Berno, Moore, Simmons and Hart (1996) contend that the tourism industry acts as a vehicle used by tourists to manage the risks related to unfamiliar environments. In providing the opportunity for a positive adventure tourist experience, the adventure tourism operator supplies both equipment and access to sites not readily found by those unfamiliar with the area. In addition to this, effective advertising literature and information from other sources creates expectations in tourists' mind of a positive adventure experience where operators manage safety at an appropriate and acceptable level.

However, there is the possibility that the tourist will have a negative experience during an adventure activity. The cause of this negative experience could be, for example, an unforeseen accident, close call or mishap. Apart from the direct physical and psychological effects that an accident has on the tourist, damaged reputations of individual operators could produce adverse consequences for the wider adventure tourism industry. These consequences may be further amplified through sensationalist reporting of accidents in the international media.

The potential for accidents is not surprising given that novice participants with minimal skills and experiences in some tourism activities are often subject to conditions of high adventure. Compounding this, inadequate advice or education on the risks involved in the activity can increase the likelihood of accidents, close calls and mishaps for adventure tourists (Mittelstaedt, 1995). Deficiencies in advice and education could be caused in part through a failure of the instructors (or guides) to judge accurately the participants' perceptions and expectations in the activity. For example, the Maritime Safety Authority's (1995c) investigation into a white-water rafting accident that led to the death of an international tourist stated:

Personnel in the industry are predominantly young men with a desire for excitement and adventure. Many are quite immature and live life 'on the edge'. This severely affects safety judgements and assessment of client capability. There is a significant difference between the guides' perceptions of an exciting trip; the guides' perceptions of client expectations and the actual clients' concept and expectations of an exciting trip. This leads to guides running trips for their own entertainment without due regard for the need of their clients. (p. 5)

Surprisingly, researchers in health tourism have neglected tourist accidents, their causes and their effects (Page and Meyer, 1996). Page and Meyer (1996), in an exploratory analysis of tourist accidents in New Zealand, state that, "relating risk taking behaviour to actual accidents remains largely unexplained, since many existing assessments of tourist accidents remain based on qualitative assessments and observations of common occurrences rather than quantitative evaluations of situations in individual countries" (p. 669). Upon analysis of available accident data bases in New Zealand, Page and Meyer (1996) argue that "how to find the most appropriate point in the tourist experience to educate and advise tourists of the risks still remains to be determined" (p. 687).

This primary aim of this paper is to provide a greater understanding of participants' adventure tourism experiences and the related components that influence this experience. An associated aim is to examine in detail some of the underlying causes of unforeseen accidents and mishaps. To achieve these aims, relevant research and concepts are reviewed to explain why tourists seek adventure and how they perceive risks inherent in adventures. Following this, a model of the adventure experience will be proposed and then integrated into a *static* framework of the adventure tourism process (ATP). Links and potential gaps within this model will then be analysed in relation to situations and circumstances that potentially lead to accidents in adventure tourism.

THE RISK IN RISK RECREATION

Ewert (1995) identifies a number of terms used by researchers to identify types of activities, including adventure recreation and adventure tourism, that fall under the broad phenomenon of "risk recreation" (p. 60). A number of researchers in the field of recreation have supported the central role of risk as a determining feature of the risk recreation experience (e.g., Allen, 1980; Brown, 1989; Ewert & Hollenhorst, 1989 & 1994; Johnston, 1992; Jones and Ellis, 1996; Priest & Baillie, 1987; Robinson, 1992). Definitions of risk recreation often mention the deliberate act of seeking risk through participation in an activity set in the natural environment (e.g., Ewert & Hollenhorst, 1989; Robinson, 1992).

The deliberate seeking of risk requires clarification. This is because the term *risk* has a range of related meanings in risk recreation research. For example, Carpenter and Priest (1989) define risk as the potential to lose something of value (physical, mental, social or physical injury). Robinson (1992) discusses the "potentially harmful nature" (p. 13) of activities and Brown (1989) talks of the "uncontrollable hazards of a natural environment" (p. 37). Ewert (1988) discusses the physical dangers and social fears in activities such as those offered by Outward Bound. Schuett (1993) acknowledges the direct relationship between perceptions of danger and perceived risk in risk recreation. In a further example, Jones and Ellis (1996) emphasise that the perceived risk, rather than some objective level of risk better defines the risk in risk recreation activities. In general, this literature indicates that that risk is a sufficient condition to elicit adventure experiences for participants in recreational activities (cf. Walle, 1997).

Adventure can be considered as a psychological experience of participants in leisure activities that have an uncertain outcome (Priest, 1992). The challenge of the activity becomes manifest through participants' effort to achieve a desired, but uncertain outcome. This uncertainty can involve the possibility of quantifiable loss where the desired outcome is not obtained (e.g., physical injury or loss of self-esteem). Alternatively, participants might simply experience a sense of disappointment through not obtaining desired achievements (e.g., an inability to prevent capsizing during a sea-kayaking trip). Where the possibility of quantifiable loss exists in participants' minds, their feelings of uncertainty will derive from the presence of this risk (this can be real or perceived). Adventure activities commonly allow participants to pit their own skills and abilities against the challenges that they face in order to overcome these inherent risks.

The structure and management of these risky activities plays a determining role in this process. For example, Hall and McArthur (1994) state "... the operator [of adventure tourism activities] may anticipate the client's own level of competence and desire for risk, and manage the product accordingly" (p. 110). Prior to examining this issue in greater detail, the following sections explore some of the reasons why participants choose to do adventure activities that carry risk and also how they assess the potential loss emanating from the risks.

MOTIVATIONS FOR DELIBERATE RISK TAKING

According to Jones and Ellis (1996), previous attempts to explain participation in high-risk activities have been descriptive rather than explanatory. In an explanatory study of risk taking behaviour, Jones and Ellis (1996, p. 278) hypothesise that the secretion of an "opiate-like" β -endorphine as a neurophysiological response to perceived risk acts as a positive reinforcement in risk recreation activities. This biological

response gives the participant pleasure and a desire to repeat the experience (Jones and Ellis, 1996). The desire to repeat the experience is presumably stronger given higher perceptions of risk (Jones and Ellis, 1996).

Although the role of arousal and emotion has been a long-standing source of debate in psychology, researchers generally accept that efficient performance and positive affect occur at an intermediate level of arousal (Zuckerman, 1991). Individuals moving beyond the optimal point of arousal will experience feelings of anxiety. Activities that have the potential to elicit extremely high arousal levels and associated anxiety (e.g., bungee jumping) can produce pleasure through the subsequent reduction of the high arousal levels (Berlyne, 1971).

Individuals also might seek pleasure through increasing their levels of arousal up to some optimum point. For example, tourists might seek out an interesting activity, such as a flat-water canoe trip. This trip would at times raise participants' arousal levels through offering spectacular views of natural scenery and wildlife. Berlyne (1971) summarises this pleasurable process in stating "... such a moderate arousal increment is followed within a few seconds by a drop towards the initial level of arousal, but the rise is what produces the hedonic effect" (p. 82).

However, while arousal may be a sufficient motivation to participants in novel activities, this concept does not account for why individuals continue in those activities after the novelty has worn off (Ellis, 1973). To explain fully deliberate risk taking behaviour it is necessary to examine other psychological and social approaches (Jones and Ellis, 1996). One explanation, related to the concept of arousal, is that participants engage in risk taking behaviour (e.g., adventure activities) to gain a sense of control of the inherent risks.

Participants' sense of control in adventure tourist activities will be directly related to their levels of self-efficacy. Bandura (1982) argues that participants require "...a strong sense of self-efficacy to withstand failures coupled with some uncertainty (construed in terms of challenge of the task, rather than fundamental doubts about one's capabilities) to spur preparatory acquisition of knowledge and skills" (p. 123). When participants acquire the knowledge and skills necessary for success in the activity, they will experience an elevated sense of specific perceived competence (Iso-Ahola, LaVerde and Graefe, 1988). Increased competence provides feelings of personal control. These feelings of control allow participants to experience a sense of achievement, feelings of enjoyment and increased self-esteem (Iso-Ahola, LaVerde & Graefe, 1988; Propst & Kurtz, 1989; Scherl, 1989). These benefits do not, however, explain completely why participants in adventure tourism activities often accept high levels of risk. Given the potential costs and benefits of the activity, an objective observer might consider this participation to be irrational behaviour. To account fully for this risk-taking behaviour, a review of research into the ways people perceive risk is now outlined.

RISK PERCEPTIONS, ACCEPTANCE AND BEHAVIOUR

Slovic (1991) emphasises the intangible nature of risk in stating "human beings have invented the concept 'risk' to help them understand and cope with the dangers and uncertainties of life" (p. 119). The concept of *risk* is subject to a number of alternative meanings (see Trimpop [1994, pp. 5-9] for a review of definitions of risk). Yates (1990, cited in Wagenaar, 1992) views risk as a multidimensional concept that on the whole refers to the prospect of loss.

This multidimensional meaning makes classification of risk taking behaviour a difficult task. For example, behaviour could be considered as risk taking where a participant consciously accepts a subjective judgement of the risk pertaining to an activity (Wagenaar, 1992). Alternatively, categorisation of risk taking behaviour could include all participants in an activity based on some objective criteria indicating the presence of risk in the given situation. This latter approach implies that the participant may not always deliberately accept or have knowledge of the true risk in the activity.

In any case, individuals must make subjective judgements of risk to facilitate appropriate choice of behaviour in a given situation (although individuals might base these judgements on an objective or 'expert' assessment). This subjective judgement of risk will in turn be based on an individual's perception of risk. This perception of risk is a cognitive and emotional response to the environment (Jones & Ellis, 1996). A number of factors influence this response including experience in the situation, personality, age, gender and culture (Kasperson & Dow, 1993). Interestingly, leisure research into risk assessment has indicated that physical risk (danger of physical injury) and psychological risk (including fears of failure and frustration from an unsatisfactory experience) best predict the overall perceptions of risk in leisure activities (Brannan, Condello, Stuckum, Vissers & Priest, 1992; Cheron & Ritchie, 1982).

Researchers in other fields have also made important contributions to the understanding of risk perceptions as they might apply to leisure activities. This has included psychology (e.g., Slovic, 1993), sociology (e.g., Lyng, 1990; Wildavsky & Dake, 1990) and group behaviour (e.g., Noe, McDonald & Hammitt, 1983). Psychologists' contributions have been largely through the identification of heuristic processes used by individuals to make decisions in the presence of uncertainty (Machlis & Rosa, 1990; Slovic, 1993). These mental strategies can work well in some situations however, "...in others they lead to large and persistent biases with serious implications for risk assessment" (Slovic, 1993, p. 225).

Other psychological and sociological influences illustrate the complexity of individual risk perceptions. For example, individuals tend to hold unrealistic optimism about their vulnerability to risks (Stapel and Velthuisen, 1996). Middleton, Harris and Surman's (1996) found this to be the case for bungee jumpers where they perceived their own risk of injury to be less than that of the typical bungee jumper. Voluntary participation in activities is also likely to induce participants into perceiving lower risks (Krimsky, 1992). Furthermore, when individuals are aware of negative outcomes in an activity, they often attribute it to a rare occurrence or a characteristic of the individual involved in the event (Walster, 1966). For instance, in the activity of high risk skydiving, participants attribute fatal crashes to the victims not having the "right stuff" necessary for the activity (Lyng, 1990, p. 859).

Level of control, mood, personality and group dynamics also influences risk perceptions. Pitz (1992), for example, cites research indicating that the difference in perceived risk between automobile driving and flying is due directly to one's perceived control of the event. In terms of mood, a happy individual is likely to underestimate the chances of a negative event while an unhappy person is likely to overestimate the chances of such an event (Salovey and Birnbaum, 1989). Wildavsky and Dake (1990) have shown that an enduring personality trait influences whether individuals perceive events as holding high or low risk. Additionally, individuals may perceive relatively lower risk in a group situation compared to being alone. This *risky-shift* phenomenon can lead individuals to abandon responsibility to another in the group, or to be influenced by bolder group members (Haddock, 1993; Noe et al., 1983).

In summary, individuals often tend to perceive less risk in behaviour that is voluntary, under personal control or undertaken as part of a group. Adventure tourists typically undertake activities voluntarily and as part of a group. The level of a participant's personal control in the activity will, however, vary between individuals and activities. If individuals' perceptions of the risk in a desired adventure tourism activity indicate that it is acceptable, they will then be likely to do the activity. If these perceptions of risk are flawed or biased or if critical information is absent, the individual may encounter risks in the activity that were unexpected. Where the individual is unprepared for this unexpected risk, the result could be a negative psychological experience caused by mishap induced fear or embarrassment, or an accident resulting in physical injury. In structured activities, the avoidance of these situations rests with the operator's structural design and the interaction between this design and the responsibilities of instructors and guides. The role of both structures and instructors in adventure tourism activities will now be examined.

THE ROLE OF STRUCTURE IN ADVENTURE TOURISM ACTIVITIES

Bandura's (1977) research suggests that participants base their self-efficacy expectations on information gained through performance accomplishments, vicarious experiences, verbal persuasion and emotional arousal. These findings have implications for the methods by which operators of adventure tourism activities provide information to participants. For example, operators have the scope to adjust tourists' self-efficacy levels through advertising and instruction before and during the activity. Similarly, the structure will determine, to a large extent, the amount of perceived risk to which participants are exposed (e.g., the section of a river traversed).

However, when adventure tourism operators attempt to manipulate participants' levels of self-efficacy, it is unlikely that they will be able to gauge the range of individual participant's previous performance accomplishments in these kinds of activities. Similarly, operators may assume that all participants seek high levels of arousal based on their experiences of previous participants. This assumption is likely given Gilchrist, Povey, Dickinson and Povey's (1995) findings that adventure tourists rated significantly higher than a control group on the psychological traits of thrill and adventure seeking, experience seeking and overall sensation seeking. Therefore, the operator may not always be able to provide participants with the necessary levels of self-efficacy to experience the full benefits of the adventure activity.

Specifically, the inability of the adventure operator to manipulate participants' self-efficacy to the appropriate levels could have two consequences. First, some participants' levels of self-efficacy will be too high to allow the attainment of desired accomplishments. For these participants, the activity will lack challenge. Second, low levels of self-efficacy could reduce a participant's level of effort in the activity. The result could be that the participant is unable to *cope* with the perceived risks. The consequences of a participant's inability to cope with, for example, perceived danger will be to experience undesired feelings of anxiety and fear (Ewert, 1988).

THE ROLE OF GUIDES AND INSTRUCTORS IN ADVENTURE TOURISM ACTIVITIES

Ellis (1973) expands on the importance of instructors in recreation experiences and their interaction with the expectations of participants:

Individual expectations are paramount. The individual should be able to expect a situation organized to allow them activities that are immediately arousing. The professional will be clearly called on to provide formal instruction in skills identified by the patrons as desirable. The process of their acquisition will be arousing and so long as there is uncertainty about the outcome.... Success must be evaluated in terms of the arousal-seeking behaviour the activity sustains. Arousal-seeking requires novel, complex and dissonant interactions. These interactions can only be related to an individual. Thus, success in a recreational setting can be gauged only in terms of an individual's expectations. (pp. 144-145)

In defining uncertainty and challenge, the instructor should give an explanation of how to cope with some risks (e.g., holding on to the raft line if you fall out of that raft during a rapid descent). Similarly, it may be necessary for the instructor to *talk up* other risks to raise participants' levels of arousal (Schreyer, White & McCool, 1980) (e.g., proposing that the dark clouds on the horizon could cause a rapid rise in the river quickly make the river rise). Instructors can also manipulate participants' levels of anxiety and fear through withholding information (Ewert, 1989) (e.g., failing to mention that an oncoming rapid presents no danger whatsoever). To summarise, adventure tourism instructors' positions, skills, experiences, skills, experience and communication proficiencies will facilitate their ability to alter participants' perceptions of the risks and provide the necessary uncertainties important to achieving targeted levels of arousal.

To target successfully the level of arousal in participants' adventure experiences, instructors require the ability to judge participants' perceptions of control and fear. As an example, an instructor on a rafting trip might plan the level of actual risk to which a participant should be subject. The instructor might base this

risk exposure on individual participants' ages, cultures, comments or behaviours in order to provide the appropriate experience (e.g., low risk exposure for an elderly Japanese female tourist or high risk exposure for a group of young male rugby players from New Zealand). The instructor's ability to judge participants' perceptions is significant given that adventure tourists are likely to have widely varying backgrounds and language abilities. Allen and Meier (1982) expand on this relationship in noting:

Face to face leaders of risk recreation programs, experts in the activity, will exhibit levels of skill superior to those of program participants or clients. But leader and follower will likely differ in many other respects as well, including perceptions of risk, perhaps, or defence mechanisms. If leaders are not aware of these often-subtle but important differences, there could be a gap in the understanding of their participants. Such a gap could conceivably result in unclear communications, misunderstandings, or faulty assumptions leading to costly accidents. (p. 49)

There is a lack of theoretical background that attempts to explain why instructors in adventure tourism settings may fail to provide participants with the appropriate experience. Explanations often will be related to ideas mentioned previously, for instance, instructors' own biases in risk perception, or their inability to gauge accurately participants' risk perceptions and their level of competency (Ewert, 1989; Robinson & Stevens, 1990). A further explanation will become apparent through examining the notion of mindfulness and mindlessness as proposed by Langer (1989).

For Langer (1989), mindlessness is a state of consciousness in which individuals process information using existing categories derived from past experience. The notion of mindlessness may have serious implications for adventure tourists' experiences given that it is often caused through repetition of behaviour (Langer, 1989). Adventure tourism instructors often deal with high volumes of people. This can result in mindlessly categorising participants and environmental hazards. As one consequence, participants who perceive risk to be greater than the average or whose competency is below the average could become subject to risk exceeding their capacity for control.

However, while risk can be apparent to an objective observer, the participant in risk recreation may not always perceive its presence. For example, Ewert and Hollenhorst (1994) argue that as "...adventure recreators seek out increasingly difficult and challenging opportunities, they paradoxically do not necessarily seek higher levels of risk" (p. 188). Recreationists with high competency, therefore, are likely to experience lower levels of perceived risk compared to novices, given the same social and physical setting. Ewert and Hollenhorst (1994) support this assertion in proposing that experienced recreationists believe "...that they are not exposing themselves to risk and danger because they can control the situation" (p. 189). Assuming that many adventure tourists are novice participants in the activities, the onus should presumably fall on the operator and instructors to ensure safety. This issue is explored further in the following section.

ADVENTURE TOURISM AND SAFETY

The adventure tourism industry offers the tourist a unique experience, often in an environment with real hazards. These hazards can lead to severe accidents and the possibility of death. Accidents in adventure tourism may have legal ramifications for a number of organisations. For example, the victim of a recent rafting accident on the Shotover River, Queenstown is intending to lodge a claim for damages in the High Court against the rafting company involved, the local district council and the Police ("Rafting Victim," 1996).

The blame attributed to tourist accidents will depend on specific situations. Johnston (1989), in her study of New Zealand mountain activities, argues that accidents are part of the experience. Where accidents do occur in the mountains, blame tends to focus on the individual involved "...for not taking appropriate care in their activities" (Johnston, 1989, p. 278). This view by society and participants counteracts the desire for regulations and restrictions in these activities and shifts the safety emphasis to education and training at the

individual level (Johnston, 1989). However, as demonstrated by accident reports, the role of the operator may be implicated in, or be a contributing factor to an accident or mishap (Page & Meyer, 1996). For example, the operator may carry some liability for an accident where, as previously mentioned, tourists have had inadequate advice or education on the risks involved in the activity (Mittelstaedt, 1995).

In both Australia and New Zealand, research has demonstrated that adventure tourists consider the level of safety in the activity to be of paramount concern (Hall and McArthur, 1994, Morgan, 1998). To address these concerns, safety codes of practice are currently being implemented in some sections of New Zealand's adventure tourism industry ("Training To Make," 1997). These safety codes will encompass key legal, environmental, safety and customer service principles (Adventure Tourism Council, undated). New Zealand's adventure tourism industry is subject to *some* legal restrictions; for instance the requirements under the Health and Safety in Employment Act (1992) which deals with, among other things, hazard management. However, the acceptance by industry leaders of accidents as a habitual occurrence in adventure tourism seems apparent from the following comments made by Chris Ryan, the New Zealand Tourism Board Deputy Chief Executive:

New Zealand is no different from any other adventure tourism destination. You do get accidents, it's inherent, but New Zealand is a very safe destination. ...It's a reality of life to be competent with the best in the business. There needs to be only one or two accidents before people go away from new operators. ...You see a lot disappear within a year if they cut corners or don't have safety equipment. ("Reputation Safe," 1997)

These comments infer that *some* adventure tourism operators are able to operate unsafe activities, even if only for a short period. Rather than having standards of operation determining entry into the industry, it appears that market forces drive the supply side based in part on adventure tourists' knowledge of a company's previous accident history. This may be a risky strategy for the industry as a whole given that some operators will operate below acceptable standards of safety in order to undercut the opposition. As mentioned earlier, subsequent accidents may damage more than just the reputation of this individual operator.

The intangible nature of a tourism experience compounds the unsafe practices of operators. This intangibility leads consumers to place a heavy emphasis on promotional material to form expectations about an activity (Roehl & Fesenmaier, 1992; Schreyer, Lime & Williams, 1984). Even if an individual operator is associated with a number of accidents, the diverse source markets may not allow efficient communication of this information to individual tourists.

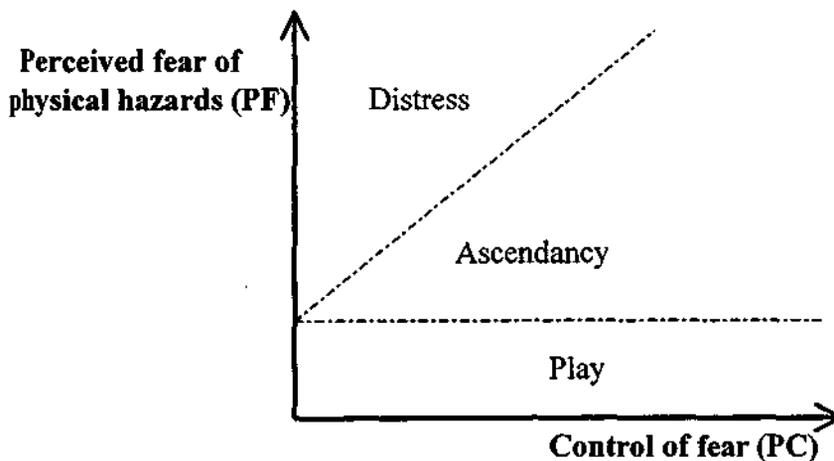
Research into the causes of tourist accidents in adventure tourism is limited. However, the overseas literature suggests that many tourist accidents are the result of the unfamiliar nature of the activities undertaken (Wilks & Atherton, 1994). This often leads to accident rates at higher levels than for the local population (e.g., Carey & Aitken, 1996). Reports of New Zealand rafting accidents involving tourists by the Maritime Safety Authority (1994, 1995a, 1995b, 1995c, 1995d) and the Transport Accident Commission (1995) have demonstrated that both participants' inaccurate perceptions and errors of judgement made by the employees of operators are a potential accident cause. These accident reports suggest that a greater understanding of adventure tourists' perceptions and how adventure tourism operators influence perceptions can aid in the improved facilitation of adventure activities for all participants.

In response to these suggestions, a model depicting the interaction of adventure tourists' perceptions of fear and control as they relate to their adventure experience is proposed. Subsequently, this model is integrated into a framework designed to provide a representation of the *ATP* from the perspectives of both the participants and the operators.

A MODEL DEPICTING ADVENTURE TOURISTS' PERCEPTIONS PARAMOUNT IN CLOSE CALLS, ACCIDENTS AND MISHAPS

The model presented in Figure 1 portrays participants' experiences, especially as they relate to accidents and mishaps in adventure tourism activities. The model specifies three conditions of challenge (play, ascendancy, and distress). These conditions derive from interaction between participants' fears, induced through the physical hazards present during the adventure, and their abilities to control those fears. The underlying premise of this model follows Morgan, Moore and Mansell's (1997) application of the Adventure Experience Paradigm (AEP) (Priest, 1992) in adventure tourism settings. This study demonstrated that during the adventures, participants' perceptions of fear and control were closely associated with the condition of challenge that they experienced. Morgan's (1998) research indicated that these participants' expectations of physical injury were also an indicator of the condition of challenge experienced. In consideration of these findings, participants' fears of physical hazards and their control over those fears are assumed to be the paramount perceptions held during close calls, mishaps and accidents.

Figure 1. The interaction of participants' fear and control in adventure tourism activities



The model depicted in Figure 1 has some important differences to the AEP (from which it derives). First, the AEP has as its axes participants' perceptions of risk and competence. Applying the AEP model to studies of accidents is complicated when attempting to measure the multi-faceted nature of participants' risk and competence perceptions. By limiting these axes to measures of fear and control, the confounding effects of factors that contribute to the AEP's conditions of adventure but not *directly* to accidents (e.g., social fears) are reduced.

Second, the challenge conditions (play, ascendancy and distress) that derive from the interaction between fear of physical hazards and control of that fear have replaced the five challenge conditions of the AEP; in the AEP these range from 'exploration and experimentation' to 'devastation and disaster'. The three conditions of challenge detailed in Figure 1 are partially based on the difference between adventure tourists' sources and levels of enjoyment in relation to risk and competence perceptions (Morgan, 1998). Participants in the play condition, for example, would primarily enjoy aspects of the adventure for reasons other than the challenge (e.g., the setting). These participants would hold low perceptions of fear and high perceptions of control during the adventure. Participants in the ascendancy condition would enjoy the challenge of meeting the physical hazards presented by the setting. For these participants, the adventure provides a test of their self-efficacy.

Participants' in the distress condition would not normally enjoy the activity. For a number of potential reasons, their levels of fear will substantially exceed their capacity for controlling that fear. This condition

of might be appropriate in some activities that are purely thrill-based (as opposed to adventure-based). In these thrill-based adventures, participants will perceive that they are in no real danger (e.g., bungee jumping or jet boating). It follows that participants in thrill-based activities will also have understood the nature of the activity and voluntarily chose to participate in it. These participants' levels of control will have more to do with internal coping processes than with matching actual competencies with the challenges at hand. In activities where at least some competence is required (e.g., white-water rafting or sea kayaking), adventure-operators would presumably avoid situations where participants are likely to experience the *distress* condition of challenge for any substantive length of time.

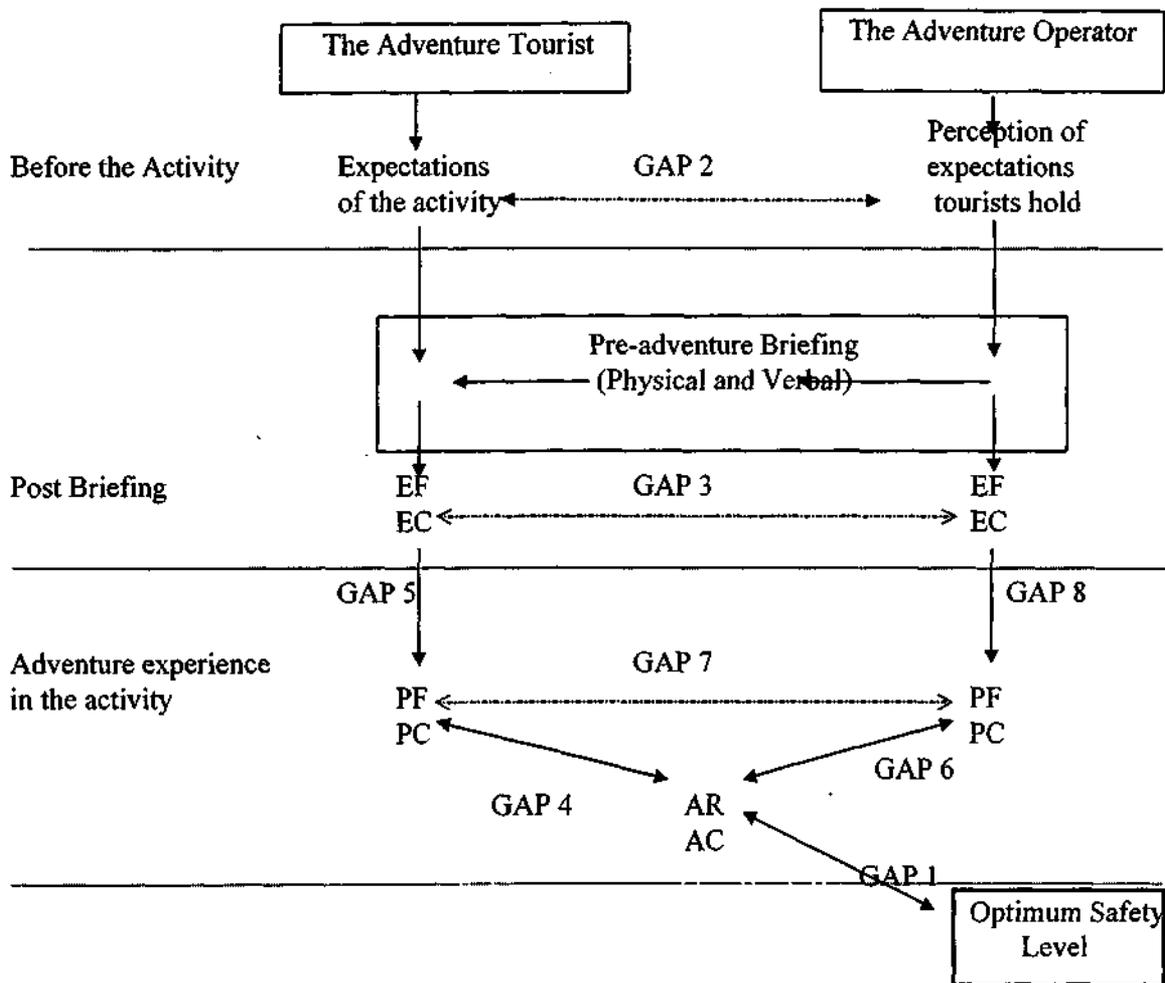
A further difference between this model of adventure tourists' experiences and the AEP is in the position of the cut off lines between each challenge conditions. In the AEP, the cut-off lines between the conditions of challenge radiate from the origin. In Figure 1, it is assumed that adventure tourists will neither experience ascendancy over physical hazards nor distress emanating from them until they are perceived to be above a certain level. Play is therefore possible even where the tourist experiences little control (e.g., falling out of a raft into a small rapid). However, beyond a certain point participants' levels of control over their fears (induced through physical hazards) will determine whether they experience either ascendancy or distress. To simplify further reference to the model proposed in Figure 1, it is referred to as the *adventure tourists' control of fear* model or ATCOF from here on.

THE ADVENTURE TOURISM PROCESS (ATP)

The proposed ATP framework outlined in Figure 2 integrates the ATCOF model at a number of points. The underlying aim of this framework is to determine which of the adventure activity's components are potentially implicated as causes of close calls, mishaps or accidents. The ATP framework is based on the links between: the adventure tourists' expectations, perceptions of fear, and control of that fear before and during the adventure; the operator's perceptions of adventure tourists; the activity itself; and the activity's operating environment. This framework also encompasses the notion of gaps between expectations and reality, and between the purchasers of the service and the service providers (Parasuraman, Zeithaml, & Berry, 1985). Components, links and gaps in the framework (Figure 2), and a number of related propositions will now be detailed.

In planning the activity, it is assumed that adventure tourism operators target the specific safety level that they consider is optimal. The physical location of the activity and the operator's adherence to legal requirements will influence this targeted safety level. The operator is also likely to consider his or her perceptions of the participants who will do the activity. More specifically, the operator will estimate the level of actual control (AC) that participants will require to meet the actual risks (AR) from the physical hazards that will be encountered. This process is reflected in the two-way arrow between AR/AC and the optimum safety level in Figure 2.

Figure 2 A framework of the adventure tourism process (ATP)



Definitions pertaining to Figure 2:

EF - expected fear of physical hazards in the activity

EC - expected control of physical hazards in the activity

PF - perceived fear of physical hazards in the activity

PC - perceived control of physical hazards in the activity

AR - actual risks caused by physical hazards in the activity the activity

AC - actual control required to cope with the hazard-induced risks in

Proposition 1:

Gap 1 will be evident where actual risk (and required actual control) in the activity is different to the risks that should apply at the optimum safety level.

If the actual risks are lower than the risks that apply at the optimum safety level, the participant may not receive the full benefits of risk exposure expected from the activity. If the actual risks are above the risk in the optimum safety level, there may be a compromise in the levels of safety for the participant. This may indicate an unforeseen event or operator incompetence.

The adventure tourists are likely to carry a number of expectations into the activity. Expectations are "...influenced by past experience, available information (both external and internal, the latter in the form of memories), attitudes, cognitive style and personality" (Moore, 1995, p. 67). The operator (including instructors or guides) will have an impression of what expectations the adventure tourists will hold for the activity.

Proposition 2:

Gap 2 indicates a difference in the participants' expectations and what the operator believes are the participants' expectations.

Expectations will be made up of a number of dimensions. Gap 2 could be indicative of differences in perceptions between the participants and the operator along one or more dimensions (e.g., the situational risk in the activity). The presence of this gap might indicate that the operator has an inadequate understanding of the tourists' motives in undertaking the activity. What is more important, the operator might misjudge the experience that the participant desires.

The operator will plan the pre-adventure briefing based on his or her perceptions of the optimum safety level, the actual risk and competence required and the adventure tourists' expectations. This briefing could include some instruction on safety and equipment use. The operator is likely to communicate some of the risk and competency requirements either implicitly or explicitly at this point. This will aid to shape the adventure tourists' expectations of physical hazards and required control. The briefing can also aid in shaping the instructor's perceptions of participants' expectations of fear and control during the adventure.

Proposition 3:

Gap 3 indicates a difference in the tourists' expectations of fear of physical hazards and control over those hazards before the activity (and after the pre-adventure briefing) and what the operator believes are the tourists' perceptions of these elements before the activity (and after the pre-adventure briefing).

Gap 3 could be the result of a failure by the operator to adequately convey information to participants. However, the presence of Gap 3 also could be due to characteristics of the participants or the group as a whole. Importantly, this Gap could be present if the operator underestimates or overestimates the participants' perceptions of either the fear or control in the activity or both simultaneously.

After the pre-adventure briefing, participants will undertake the part of the activity that involves the adventure and the potential exposure to risk from hazards.

Proposition 4:

The presence of Gap 4 indicates whether the participant becomes aware of the true risks from physical hazards and exhibits the actual control required to deal with those risks.

This Gap can be expected to occur, as the novice participant's perception of risk should be *higher* than the real risk encountered (Ewert and Hollenhorst, 1989). Thus, for most of the participants, this gap will occur through an overestimation of the actual risks. Gap 4 could also occur through participation in an activity where the actual risks are higher than expected risks. This participation is a form of non-deliberate risk taking. Where participants lack the actual control required in dealing with the fear emanating from the higher than expected risks they will experience a higher than expected challenge condition terms of the ATCOF model. However, the presence of Gap 4 might be unknown to the participant. Where the actual risks are greater than the perceived risk, the participant may have undertaken risks without the awareness of them. Unknown exposure to risk will not influence participants' perceptions of fear in the adventure.

It is likely that participants' perceptions of fear and control will change from before the activity to after it. One reason could be through participants' more astute assessment of the actual risks and as a result of learning new techniques and behaviours in the activity (Priest, 1992).

Proposition 5:

The presence of Gap 5 indicates a difference between participant's expected fear and control before the adventure experience to that experienced during the adventure.

Participants' perceptions could be expected to move closer in line to the measures of actual risk and actual control referred to in Proposition 4. In terms of the ATCOF model, the balance of fear and control expected before the experience will determine the condition of challenge that the participant is anticipating. The participant's balance of fear and control after adventure experience will similarly determine the challenge condition that they actually experienced.

Further gaps in the ATP framework acknowledge the potential differences between the operator's assumptions (if any are held) of participants' perceptions of fear and control during the adventure and other risk and control measures. Specifically, Gap 6 refers to a discrepancy between the operator's plan and the actual fear and control assumed by the operator to be appropriate. Gap 7 refers to a discrepancy between the operator's assumptions of participants' perceptions of fear and control and what participants experience. Gap 8 refers to the discrepancy between the operator's assumptions of the fear and control expectations that participants should carry into the activity and the fear and control expectations that participants should experience. These gaps (if not intuitively planned in advance by the operator) could be caused through, among other things, the operator's misjudgment of the setting (Gap 6), the operator misjudging the tourists (Gap 7) or ineffective training and communication techniques (Gap 8). Operators' (or instructors') overconfidence or inexperience could also be an underlying cause or exacerbate of the size of these gaps.

LINKAGES IN THE ATP FRAMEWORK

In the ATP, Gaps 1, 2 and 3 could directly contribute to, or be evidence of a failure by the operator to communicate the appropriate levels of risk and competencies that ensure a positive adventure tourist experience. These gaps could also contribute to tourists taking risks non-deliberately. For example, if tourists carry inappropriate perceptions into the activity, as evidenced through the presence of Gap 3, the gap between expectations and reality (Gap 5) may lead to a less than optimal experience. This situation could arise where the hazards experienced were well beyond those expected. This experience may also be associated with the presence of Gap 4.

The ATP framework and associated propositions provide a useful starting point to assess adventure tourists' experiences and factors that influence these experiences. Of course, many adventure tourism activities cannot be classified into discrete sections as implied in Figure 2. In many activities, the process of communicating risks and teaching new competencies will continue throughout the adventure. Similarly, as this framework attempts to illustrate the links in the ATP through a simplification of reality, it cannot consider every possible scenario and influence. Only those gaps that are presumed directly relevant to the experience and safety in the adventure activity have been outlined.

IMPLICATIONS FOR RESEARCH INTO THE ADVENTURE TOURISM INDUSTRY

The ATP framework allows adventure tourism operations, and participants' experiences of those operations, to be analysed in discrete components. Although the *static* nature of this approach detracts somewhat from the situation in the real world, it does facilitate detailed analysis of components of adventure activities from the perspectives of both the operator (and their employees) and the participants. Further, the ATP allows specific attention to be placed on the wider influences of the adventure; the activity's structure, its

relationship to an appropriate safety level, and the role of the pre-adventure briefing for both participants and instructors. Based the ATP framework, a number of research areas are suggests below.

One research area concerns how adventure tourists actually perceive risk. For example, do some participants perceived their own vulnerability to risk differently to other participants (e.g., through holding higher competence)? Do others put more faith in the company's safety standards. How do social, cultural or psychological influence subjective appraisals of the dangers in the activity? As discussed in earlier, some potential reasons for individual differences in risk perception include personality characteristics, levels of perceived control and the influences of group dynamics. In affecting risk perceptions, these factors may carry varying weights and work in combination for different individuals. These areas are probably best explored using qualitative style research. Findings could then provide a basis to assess any gaps between participants and instructors in the activities.

When Ewert (1989) investigated participants' and instructors' perceptions of fear in Outward Bound courses, he argued that "too often programming is based on the 'shotgun approach,' everyone gets the same blast despite who they are or what they need" (p. 19). In addition to this, previous research in both outdoor recreation (Ewert, 1989) and adventure tourism (Morgan, 1998) has demonstrated that instructors can overestimate participants' perceptions of the fears and risks in adventure activities (cf. Gap 7 in the ATP framework). Robinson and Stevens (1990), however, contend that given sufficient interaction between instructors and participants, group leaders can accurately assess participants' perceptions of the adventure. Future research should investigate the type and level of interaction between instructors and participants is necessary to provide this accurate assessment of clients' adventure perceptions and expectations. Similar questions concern which cues given by instructors (e.g., verbal persuasion versus modelling) influence participants' expectations, feelings of control and the conditions of adventure. Research using a quasi-experimental approach with ATCOF challenge conditions as the dependant variable under a range of different treatments would be appropriate. The answers provided through this area of research could determine which influences should be manipulated in provide a superior adventure tourism product.

Many adventure tourism activities will use promises of excitement and thrills to attract participants. The operators of these kinds of adventures must negotiate the boundary between providing a safe activity and providing adequate thrills and excitement for participants. Where participants feel that they have adequate control, the dual and conflicting objectives of safety and arousal-generation should be achievable. To alert participants to the challenge in the adventure, instructors could provide improved access to information at the pre-adventure briefing. Techniques such as videos of previous trips, informal conversations with instructors or placing more emphasis on the importance of safety gear could increase all participants' vigilance of the real dangers in the activity. This could result in participants being mindful of requirements for competency to deal with the risks in the adventure. Further, instructors should emphasise the ability of participants to make their own choices regarding the type and length of participation. If participants have an astute knowledge of the true risks and feel they choose to undergo them freely, then they will be likely to concentration more and gain intrinsic rewards from feelings of control in the adventure.

In a competitive adventure tourism market, the natural tendency is for operators of thrill-based adventures to advertise and attempt to provide a more exciting experience compared to that offered by their rivals. However, potential adventure tourists attracted to these activities will have a range of risk perceptions and expectations of competencies. Further, the setting will largely determine the thrills that are available in a particular activity. In any case, consumers should be able to choose between a range of adventure activities. If this choice is made in the presence of relevant and realistic information, the activity should provide a positive adventure experience and result in satisfied customers. Studies in fear, control and enjoyment using simple survey-based methodology should be able to determine whether the thrills and excitement are adequate (or too much) for the majority of the clientele in a specific setting. Where the potential thrills in an activity are found to suit specific market segments, operators can fine tune their advertising efforts towards this segment.

Other adventure-based tourist activities will have a stronger focus on self reliance, learning and competency development. These activities will typically require settings that allow participants to experience solitude and natural beauty. Resource planners, in facilitating appropriate adventure tourism operations, need to consider the relationship of the adventure experience on offer to the setting of that experience and the potential target markets of adventure tourists. Where this match is appropriate, participants' adventure experiences would be enhanced. Analysis of these competency-based activities using the ATP framework will be useful in assessing whether the nature of the experience is appropriate to the clientele. Positive adventure experiences will then provide ongoing and positive advertising (e.g., word of mouth) for New Zealand's adventure tourism industry (cf. Danaher & Arweiler, 1996).

In summary, the ATP has been presented as a basis for understanding which gaps (if any) are associated with the underlying cause of known accidents. Where a gap is found to be consistently associated with accident occurrences (e.g., participants entering the activity with expectations of fear well below that which will be generated through the real physical risks), procedures could be recommended to facilitate the closure of those gaps (e.g., videos of previous mishaps shown to participants before the activity).

Studies based on the ATP framework outlined above will potentially aid in the development of adventure industry standards. These standards would be based on objective safety criteria specifying hazards pertaining to particular classes of activities. In many cases, activities could be standardised using existing classification systems that rate the difficulty of specific settings (e.g., grading of difficulty in white-water rapids from one through to six). To gain employment at each standard, instructors and guides would require accreditation at specific levels of competencies (in both hard and soft skills) and perhaps in specific settings.

Tourists would become aware of this system and be provided with information regarding classification of individual activities. Activities would themselves be structured to convey specific information to participants dependent on the difficulty level. Similar to the instructors, participants could be provided with 'certificates of achievement' which would allow them to progress through difficulty levels. . In effect, the system would determine entry standards at each level of adventure for operators, instructors and participants.

Such a system could be useful as a marketing strategy (regarding safety assurances) and through this also increase participation rates (as tourists aim to match increasingly higher self-efficacy levels and adventure attainments). The system would also signal to participants' suitable adventure activities and thus provide a safer and more optimal match of demand and supply within the industry. It is envisaged that this system would work as a voluntary regulatory code. If carefully marketed, the system would act as a barrier to entry to non-associated operators who have neither appropriate levels of safety nor adequate employee expertise.

As a final word, it is hoped that this review will stimulate further research into all the aspects of the growing phenomenon of adventure tourism in New Zealand and elsewhere. Greater understanding of this important component of the tourism industry will benefit adventure tourists, adventure operators and through this increase the industry's potential for success.

REFERENCES:

- Adventure Tourism Council. (Undated). Standards assurance programme for the adventure tourism sector. (Available from the Adventure Tourism Council, PO Box 3859, Christchurch).
- Allen, S. , & Meier, J. F. (1982). Let's take a risk with adventure recreation! Parks and Recreation, 17(2), 47-50.
- Allen, S. D. (1980). Risk recreation: A literature review and conceptual model. In J.F. Meier, T.W. Morash & G.E. Welton. (Eds.), High adventure outdoor pursuits: Organisation and leadership (pp. 52-81). Utah: Brighton Publishing.

- Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavioural change. Psychological Review, 84(2), 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 32(2), 122-147.
- Berlyne, D. E. (1971). Aesthetics and psychobiology. USA: Meredith Corporation.
- Berno, T., Moore, K., Simmons, D. , & Hart, V. (1996). The nature of the adventure tourism experience in Queenstown, New Zealand. Australian Leisure, 7(2), 21-25.
- Brannan, L., Condello, C., Stuckum, N., Vissers, N., & Priest, S. (1992). Public perceptions of risk in recreational activities. Journal of Applied Recreation Research, 17(1), 144-157.
- Brown, I. (1989). Managing for adventure recreations. Australian Parks and Recreations, 25(4), 37-40.
- Carey, M. J., & Aitken, M. E. (1996). Motorbike injuries in Bermuda: A risk for tourists. Annals of Emergency Medicine, 28(4), 424-429.
- Carpenter, G., & Priest, S. (1989). The AEP and non-outdoor leisure pursuits. Leisure Studies, 8(1), 65-75.
- Cheron, E. J., & Ritchie, J. R. B. (1982). Leisure activities and perceived risk. Journal of Leisure Research, 14(2), 139-154.
- Danaher, P. J., & Arweiler, N. (1996). Customer satisfaction in the tourist industry: A case study of visitors to New Zealand. Journal of Travel Research, 35(1), 89-93.
- Ellis, M. J. (1973). Why people play. USA: Prentice-Hall.
- Ewert, A. (1988). Reduction of trait anxiety through participation in outward bound. Leisure Sciences, 10, 107-117.
- Ewert, A. (1989). Managing fear in the outdoor experiential education setting. Journal of Experiential Education, 12(1), 19-25.
- Ewert, A. W. (1995). Current trends in risk recreation: The impacts of technology, demographics, and related variables. In J.L. Thompson, D.W. Lime, B. Gartner, & W.M. Sames (Eds.), Proceedings of the fourth international outdoor recreation and tourism trends symposium and the 1995 national recreational resource planning conference (pp. 60-64). St Pauls, Minnesota: University of Minnesota.
- Ewert, A., & Hollenhorst, S. (1989). Testing the adventure model: Empirical support for a model of risk recreation participation. Journal of Leisure Research, 21, 124-139.
- Ewert, A., & Hollenhorst, S. (1994). Individual and setting attributes of an adventure recreation experience. Leisure Sciences, 16, 177-191.
- Gilchrist, H., Povey, R., Dickinson, A., & Povey, R. (1995). The sensation seeking scale: Its use in the study of the characteristics of people choosing 'adventure holidays'. Personality and Individual Differences, 19(4), 513-516.
- Haddock, C. (1993). Managing risks in outdoor activities. Wellington: Mountain Safety Manual 27, NZMSC inc.

- Hall, C. M., & McArthur, S. (1994). Commercial white water rafting in Australia. In D. Mercer (Ed.), New viewpoints in Australian outdoor recreation research and planning (pp. 109-118). Australia: Harper Marriott and Associates.
- Health and Safety in Employment Act, (1992).
- Iso-Ahola, S. E., LaVerde, D., & Graefe, A. R. (1988). Perceived competence as a mediator of the relationship between high risk sports participation and self-esteem. Journal of Leisure Research, 21(1), 32-39.
- Johnston, M. E. (1989). Peak experiences: Challenge and danger in mountain recreation in New Zealand. Unpublished doctoral dissertation, University of Canterbury, Christchurch, New Zealand.
- Johnston, M. E. (1992). Facing the challenges: Adventure in the mountains of New Zealand. In C. M. Hall and B. Weiler (Eds.), Special interest tourism (pp. 159-169). Great Britain: Belhaven Press.
- Jones, R. A. & Ellis, G.D. (1996). Effects of variation in perceived risk on the secretion of b-endorphine. Leisure Sciences, 18(3), 277-291.
- Kasperson, R. E., & Dow, K. (1993). Hazard perception and geography. In T. Garling & R. G. Golledge (Eds.), Behaviour and environment: Geographical and psychological approaches (pp. 193-222). The Netherlands: Elsevier Science Publishers B.V.
- Krimsky, S. (1992). The role of theory in risk studies. In S. Krimsky & D. Golding (Eds.), Social theories of risk (pp. 3-22). USA: Praeger.
- Langer, E. J. (1989). Mindfulness: Choice and control in everyday life. Great Britain: Harvill.
- Lyng, S. (1990). Edgework: a social psychological analysis of voluntary risk taking. American Journal of Sociology, 95(4), 851-886.
- Machlis, G. E., & Rosa, E. A. (1990). Desired risk: Broadening the social amplification of risk framework. Risk Analysis, 10(1), 161-168.
- Maritime Safety Authority (1994). Accident Report and Investigation Summary (Report No. 94 487). Wellington: Author.
- Maritime Safety Authority (1995a). Accident Report and Investigation Summary (Report No. 958 576). Wellington: Author.
- Maritime Safety Authority (1995b). Accident Report and Investigation Summary (Report No. 94 635). Wellington: Author.
- Maritime Safety Authority (1995c). Accident Report and Investigation Summary (Report No. 94 806). Wellington: Author.
- Maritime Safety Authority (1995d). Accident Report and Investigation Summary (Report No. 94 814). Wellington: Author.
- Middleton, W., Harris, P., & Surinam, M. (1996). Give 'em enough rope: Perception of health and safety risks in bungee jumpers. Journal of Social and Clinical Psychology, 15(1), 68-79.
- Ministry of Tourism. (1992). Tourism sustainability: A discussion paper (Issue paper No. 2). Wellington: Ministry of Commerce.

- Mittelstaedt, A. H. (1995). Tourist and vacationist safety. In J.L. Thompson, D.W. Lime, B. Gartner, & W.M. Sames (Eds.), Proceedings of the fourth international outdoor recreation and tourism trends symposium and the 1995 national recreational resource planning conference. (pp. 485-490). St Paul, Minnesota: University of Minnesota.
- Moore, K. (1995). Understanding the individual recreationist: From motivation to satisfaction? In P. J. Devlin, R. A. Corbett & C. J. Peebles (Eds.), Outdoor Recreation in New Zealand: Vol 1. A Review and Synthesis of the Research Literature (pp. 63-97). New Zealand: Department of Conservation and Lincoln University.
- Morgan, D. J. (1998). The adventure tourism experience on water: Perceptions of risk and competence and the role of the operator. Unpublished masters thesis, Lincoln University, Canterbury, New Zealand.
- Morgan, D., Moore, K., & Mansell, R. (1997). The Adventure Experience Paradigm: Where Do Adventure Tourists Fit In? Leisure, People, Places and Spaces: Proceedings of The 3rd Conference of the Australian and New Zealand Association for Leisure Studies. Newcastle: Australia.
- New Zealand Tourism Board. (1996a). Tourism in New Zealand: Strategies and progress. Wellington: Author.
- New Zealand Tourism Board. (1996b). Australia market brief (July 1996). Wellington: Author.
- Noe, F. P., McDonald, C. D., & Hammitt, W. E. (1983). Comparison of perceived risk taking in groups and implications drawn from the risky-shift paradigm. Perceptual and Motor Skills, 56, 199-206.
- Page, S. J., & Meyer, D. (1996). Tourist accidents: An exploratory analysis. Annals of Tourism Research, 23(3), 666-690.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. Journal of Marketing, 49(4), 41-50.
- Pitz, G. F. (1992). Risk taking, design and training. In F. J. Yates (Ed.), Risk taking behaviour. (pp. -). England: John Wiley and Sons Ltd.
- Priest, S. (1992). Factor exploration and confirmation for the dimensions of an adventure experience. Journal of Leisure Research, 24, 127-139.
- Priest, S., & Baillie, R. (1987). Justifying the risk to others: The real razor's edge. Journal of Experiential Education, 10(1), 16-22.
- Propst, D. B., & Kurtz, M. E. (1989). Perceived control/reactance: A framework for understanding leisure behaviour in natural settings. Leisure Studies, 8, 241-248.
- Rafting victim to sue. (1996, November 5). The Christchurch Press, p. 1.
- Reputation safe despite fatalities. (1997, January 8). The Christchurch Star, p. 2.
- Robinson, D., & Stevens, T. (1990). Stress in adventure recreation: Types of influences during an extended adventure based expedition. Journal of Applied Recreational Research, 15(4), 218-238.
- Robinson, D. W. (1992). A descriptive model of enduring risk recreation involvement. Journal of Leisure Research, 24(1), 52-63.
- Roehl, W. S., & Fesenmaier, D. J. (1992). Risk perceptions and pleasure travel: An exploratory analysis. Journal of Leisure Research, 30(4), 17-26.

- Salovey, P., & Birnbaum, D. (1989). Influence of mood on health-relevant cognitions. Journal of Personality and Social Psychology, 57(3), 539-551.
- Scherl, L. M. (1989). Self in wilderness: understanding the psychological benefits of individual-wilderness interaction through self-control. Leisure Sciences, 11(2), 123-135.
- Schreyer, R., Lime, D. W., & Williams, D. R. (1984). Characterising the influence of past experience on recreational behaviour. Journal of Leisure Research, 16(1), 34-50.
- Schreyer, R. M., White, R., & McCool, S. F. (1980). Common attributes uncommonly exercised. In J. F. Meier, T. W. Morash, & G. E. Welton (Eds.), High adventure outdoor pursuits: Organisation and leadership (pp. 24-29) Utah: Brighton Publishing.
- Schuett, M. A. (1993). Refining measures of adventure recreational involvement. Leisure Sciences, 15, 205-216.
- Slovic, P. (1991). Beyond numbers: A broader perspective on risk perception and risk communication. In D. G. Mayo & R. D. Hollander (Eds.), Acceptable evidence: Science and values in risk management (pp. 48-65). USA: Oxford University Press.
- Slovic, P. (1993). Perceptions of environmental hazards: Psychological perspectives. In T. Garling, R. G. Golledge (Eds.), Behaviour and environment: Geographical and psychological approaches (pp. 223-248). The Netherlands: Elsevier Science Publishers B.V.
- Stapel, D. A., & Velthuisen, A. S. (1996). "Just as if it happened to me": The impact of vivid and self-relevant information on risk judgements. Journal of Social and Clinical Psychology, 15(1), 102-119.
- Training to make rafting safer. (1997, January 11). The Christchurch Press, p. 7.
- Transport Accident Commission. (1995). Transport accident investigation (Report No. 95-210). Wellington: Author.
- Trimpop, R. M. (1994). The psychology of risk taking behaviour. Netherlands: North-Holland.
- Wagenaar, W. A. (1992). Risk taking and accident causation. In F. J. Yates (Ed.), Risk taking behaviour (pp. 257-281). England: John Wiley and Sons Ltd.
- Walle, A. H. (1997). Pursuing risk or insight: Marketing adventures. Annals of Tourism Research, 24(2), 265-282.
- Walster, E. (1966). Assignment of responsibility for an accident. Journal of Personality and Social Psychology, 3(1), 73-79.
- Wildavsky, A., & Dake, C. (1990). Theories of risk perception: Who fears what and why? Daedalus: Proceedings of the American Academy of Arts and Sciences, 119, 41-60.
- Wilks, J., & Atherton, T. (1994). Health and safety in Australian marine tourism: A social, medical and legal appraisal. The Journal of Tourism Studies, 5(2), 2-16.
- Zuckerman, M. (1991). Psychobiology of personality. USA: Cambridge University Press.