

## Nature/Person Transactions During An Outdoor Adventure Experience: A Multi-Phasic Analysis<sup>1</sup>

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Few studies have addressed the changing nature of adventure recreation experience as it unfolds during the activity. This study explores a black-water rafting trip through a cave by examining person/nature transactions at selected points in the journey and by analyzing participants' post-trip written accounts about the experience. Key variables used to define the person-nature transaction included focus of attention, mood states, and perceptions of risk and competence. Study results indicated that each of these variables varied with environmental context. However, broad patterns of variation in these same variables were also evident across time and phase of the experience. In their personal accounts, participants in this extraordinary nature experience expressed many of the values that western cultures have attributed to natural places.

**KEYWORDS:** *Adventure recreation, person/nature transactions, moods, experiential sampling, personal accounts.*

### Introduction

Today, people experience natural places in at least five ways, the most common being on trips of short duration to natural areas with close companions and family (Cordell, Bergstrom, Hartmann, & English, 1990). In addition, experience of natural places occurs through commercial adventure or nature-based experiences; in challenge, corporate development programs; through owning or using a holiday home and for a significant minority, during extended experiences in wild nature. Our study focuses on one of these, the commercial adventure recreation experience.

In this study, we describe the dynamic nature of an intense and extraordinary adventure recreation experience, rafting through the Ruakuri Cave (black-water rafting) at Waitomo in New Zealand. Our purposes are to describe the lived and reflected experience prior to entry into the cave, at selected sites inside the cave, and at the end of the trip. We are especially interested in how recreationists construct their experience during their recreational engagement, whether there are recognizable patterns in the unfolding experience, and the role of environmental context and personal

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characteristics in shaping person-nature transactions. Our study builds on those who have previously studied the dynamic, complex, and multi-phasic nature of recreation experiences (e.g., Arnould & Price, 1993; Celsi, Rose, & Leigh, 1993; Hammitt, 1980; Hartig, Mang, & Evans, 1991; Hull & Michael, 1995; Hull, Michael, Walker, & Roggenbuck, 1996; Klausner, 1967; Lee, Dattilo, & Howard, 1994; Manfreda, Driver, & Tarrant, 1994; Scherl, 1990). Our contribution is to examine a recreational experience which is intense, adventurous, and packaged. We focus on an activity that for many would seem to cause apprehension, anxiety, and even fear. In addition, following the recommendations of Arnould and Price (1993), Hartig et al. (1991) and Lee et al. (1994), we employed multi-methods in our quest for understanding.

However, we believe it is not only the unfolding of the lived experience that is important in understanding how people experience adventure in natural settings. The written or spoken accounts of these nature visits which people communicate to others or indeed tell to themselves are equally significant. Such personal accounts about nature experiences are reconstructions of the visit, viewed through the lenses of individual perceptions, past experiences, and the passage of time. The role of personal accounts is to provide a perspective on those aspects of the nature experience that are remembered, elaborated on and used to create meaning for the person. In a sense, this is a stage in the embedding of the event, how the reconstruction of the person-nature transaction is used to reflect aspects of self both internally and to the world at large (Bruner, 1990).

### Review of Literature

That outdoor recreation is more than free time or an activity freely chosen, but rather an intrinsically rewarding experience, is now universally accepted (Driver & Tocher, 1970). That outdoor recreation is more than a treasured place, but rather a multi-phasic experience that unfolds across time, has also long been known (Clawson & Knetsch, 1966). But this latter characteristic of recreation has received relatively little attention from leisure theorists and practitioners alike (Manfreda et al., 1994). Most studies of leisure and most efforts by managers to enhance leisure have focused on the on-site phase, and have paid less attention to the anticipation or planning, the travel-to, the travel back, and the recollection phases. Finally, only recently, have researchers recognized and begun to measure what recreationists have known all along, that the leisure experience is dynamic within any of the phases (Hull & Michael, 1995; Hull, Stewart & Yi, 1992; Hull et al., 1996).

#### *Leisure Experiences*

We see nature-based adventure recreation as one type of leisure that we can begin to examine and understand by focusing on its experiential qualities. But the literature suggests many approaches and much confusion about

the nature and measurement of leisure experiences in general, and adventure recreation in particular. Leisure is often defined by its prerequisites or determinants (e.g., perceived freedom and intrinsic motivation) and/or its beneficial products or consequences (e.g., family bonding, stress reduction, and self-esteem) (Driver & Brown, 1986; Samdahl, 1991; Tinsley & Tinsley, 1984). Both of these approaches are limiting in the sense that they focus on pre and post assessments of leisure experiences, and thus fail to give due regard to the richness and complexity of such experiences. If we are to understand leisure experiences fully, we need also to focus on participants' immediate conscious experience (e.g., thoughts, images, feelings and sensations) during leisure.

To attempt to measure all the dimensions of leisure indicated in the literature (e.g., Tinsley & Tinsley, 1984) during the lived experience would likely have changed the nature of the experience itself and would have been unrealistic in practice. Given this, and following the advice of Ittelson (1978), Knopf (1987), Mannell (1980) and the work of Hull and his colleagues (e.g., Hull et al., 1996) we decided to look at recreationists' focus of attention, their moods, on-site nature experience, and their feelings of risk and competence during a nature-based adventure experience.

#### *Focus of Attention*

Knopf (1987) has noted that when people experience nature in leisure settings, they are not simply responding to a collection of physical attributes. Instead, they are involved in a transactional process in which the natural setting and the person "jointly define one another and contribute to the meaning and nature of an holistic event" (Altman & Rogoff, 1987, p. 24). Environmental psychologists have studied this transaction by examining the modes in which people experience the environment (Ittelson, 1978). Five modes seem dominant: focus on nature as an object or place; focus on self and internal thoughts; focus on others; focus on emotions and affect; and focus on task or activity (Borrie, 1995). At any given moment during a nature-based leisure experience, one or more of these experiential modes may be dominant, and the recreationist would describe the environment and his or her experience in the context of this person-environment transaction.

#### *Mood*

Mood is pervasive to the human condition. It is defined as "the subtle subjective state or feelings of a person at any given moment" (Hull, 1991, p. 252). It refers to specific sets of subjective feelings (e.g., excited, bored, stressed, relaxed, aroused and drowsy) which occur as a consequence of everyday experiences. Leisure theorists commonly contend that "leisure is a positive experience accompanied by satisfying and pleasurable moods, emotions, or feelings" (Mannell, 1980, p. 77). In addition, mood and mood changes have been found to be sensitive to the multi-phasic and dynamic

nature of the lived and remembered leisure experience (e.g., see Hammitt, 1980; Hull, 1990; Hull & Michael, 1995; Hull et al., 1992; Hull et al., 1996). Finally, mood can apparently be measured validly and reliably during the experience without unduly disrupting or changing the nature of the experience (Hull & Michael, 1995). In summary, mood seems to provide a reliable and valid indicator of the quality of leisure, and one which is especially sensitive to the dynamic nature of the leisure event.

*The Dynamic Nature of Moods in Leisure Contexts.* Some moods change in predictable ways during the leisure event, both across and within phases of the experience (Arnould & Price, 1993; Hammitt, 1980; Hull & Michael, 1995; Hull et al., 1992; Klausner, 1967). For example, Hammitt (1980) found that among students on a field trip to a bog, positive moods such as involvement (i.e., vigorous, energetic, concentrating, kindly, active, intent, and engaged in thought) and fulfillment (i.e., playful, carefree, pleasure) increased during the travel to and on-site phases of the recreation experience, declined during the travel back stage, and remained about the same at recollection. Klausner (1967) found that during the on-site phase of a parachuting experience, fear increased continuously and enthusiasm decreased slightly until the moment of jumping. Immediately after jumping but before landing, enthusiasm reached high levels and fear dropped. At the landing, fear again increased, but gradually subsided upon a successful landing, when enthusiasm reached its peak. Moods like anxiety often decreased during the on-site experience (Hull & Michael, 1995). Pleasant moods are frequently higher at the end of a site visit, but sometimes, unpleasant moods increase then too (Hull & Michael, 1995; More & Payne, 1978).

Some moods appear to change little, if at all, during the recreational engagement. For example, Hammitt (1980) found that feelings of resentment did not change during the five phases of a bog field trip, and Hull et al. (1992) reported no change in feelings of dominance and being rushed during a wilderness day-hike.

Moods are not always pleasant during leisure events. Research shows sharp spikes of unpleasant moods during leisure, some sporting events and adventure recreation. For example, parachutists at times reported fear (Klausner, 1967); white-water rafters sometimes felt apprehensive and anxious before entering rapids (Arnould & Price, 1993), and Outward Bound participants had unpleasant arousal (i.e., fear and apprehension) as they were about to abseil down into a canyon (Scherl, 1990). Finally, Lee et al. (1994) found that recreationists engaged in various activities frequently mentioned feelings of exhaustion, apprehension, nervousness, disappointment, frustration, and guilt during their leisure event. On the other hand, recollection fosters pleasant mood states, often higher than at the end of the on-site recreation experience (Arnould & Price, 1993; Hartig et al., 1991; Lee et al., 1994)

*Environmental Influences on Mood.* Research has confirmed that environmental variables and the activity-environment fit shape moods during the on-site experience (Hull et al., 1992; Hull & Michael, 1995; McIntyre & Catter-

mole, 1997). For example, day-hikers on a wilderness trail generally reported less relaxation, more boredom, and less excitement while walking through an enclosed forest than through an open forest or at a vista point (Hull et al., 1992). Hull & Michael, (1995) also found that students walking along a rural road with pleasant views often felt calmer, more excited, and less dull than did students walking in a town or at leisure indoors. McIntyre and Cattermole (1997) showed that involvement with nature during such activities as flat-water canoeing and backpacking enhanced pleasant moods such as cheerfulness and feelings of freedom.

*Person Influences on Mood.* Person variables seem to shape moods during the on-site experience. For example, Hull et al. (1992) found their wilderness day-hikers walking along the same trail clustered into distinct groups on 'how bored they felt' during their hike. Such mood differences appear to be explained by sensation-seeking personality differences, the subject's physical condition, and perceived risk and competency in successfully completing the task.

In summary, past research in the leisure context has provided particular insights into the way in which leisure experiences and mood states interact. Four key findings have resulted from this research: some moods change in predictable ways during the leisure event; some vary in their patterns of change across recreation contexts; both environmental and person variables shape moods during the on-site experience; and moods are not always pleasant throughout the recreational engagement.

### *On-Site Nature Experiences*

The view we take is that experiences in natural settings result from a transaction between people and the natural environment (Ittelson, Franck & O'Hanlan, 1976; Williams, 1986). These experiences are not determined simply by nature, but instead are partially based on active cognitive processes that involve interpretation of stimuli from the environment (Leff, 1978). People to a large extent create their own experiences based upon past learning, their needs, and selective focusing (Leff, 1978). Thus, the environment becomes the product of perception, not the cause (Ittelson et al., 1976).

Few leisure researchers have focused on studying the person-environment transaction in natural environments, particularly as the nature experience unfolds on-site. Kaplan and Talbot (1983) measured the responses of adolescents to the natural environment across the days of an Outdoor Challenge Program. With time, nature descriptions entered into journals became more detailed, and emotional responses became more intense. Familiarity and degree of comfort with the physical environment also increased with time.

Scherl (1990) studied the dynamic nature of adults' experiences on a nine-day Outward Bound Course in wilderness in Australia. This course emphasized programmed activities, often in group settings, to foster personal growth. Scherl found that participants focused principally on self in terms

of activities and emotions and on the social setting rather than on the natural environment. Only on the solo day was the physical environment uppermost in people's minds.

Borrie (1995) measured focus of attention among recreationists during a canoe trip into a wilderness area in the USA. Measures at random times during the experience suggested that visitors focused most often on nature and group members. Noted somewhat less often was a focus on task, and concentration on emotions and thoughts was least frequent of all. In the same study, Borrie (1995) measured whether canoeists achieved the positive connections with nature suggested by the writings of American wilderness philosophers such as Thoreau, Muir and Leopold. Dimensions of this person-nature transaction comprised *care, solitude, oneness, humility, primitiveness and timelessness*. Feelings of care for the environment and a sense of timelessness were most prevalent. Feelings of solitude, oneness, and humility were mid-range, and primitiveness was seldom felt. These feelings did change over the course of the on-site visit, but only humility did so in a significant way. It was greater near the end of the trip than during early stages.

Using a reduced version of this same scale in a study of backcountry canoeists in Australia, McIntyre (In press) found that perceptions such as *care* for nature, a sense of *solitude*, feelings of *primitiveness*, and *oneness* with nature were significantly enhanced when wilderness users were involved in recreational activities such as flat-water canoeing rather than in passive contemplation. However, a sense of *timelessness* was significantly more likely to be felt in the latter situation.

The few studies undertaken to this point in time which have attempted to understand the on-going nature experience suggest that the way the visit is constructed and the time in the nature place are important influences on the frequency, kind, content, and flow of nature focus and nature connections.

### *Risk and Competence*

Risk, challenge and competence are all central aspects of adventure recreation, whether it is undertaken as a personal venture or purchased as a commercial product. Risk is defined as the potential to lose something of value (Priest, 1990). Three types of risk are generally recognized: absolute, real and perceived risk (Haddock, 1993). In commercial adventure recreation operations, absolute risk is assessed and safety procedures are implemented to ensure that the real risk to participants is minimized. Perceived risk is a measure of the level of risk in a particular context as judged by the individual, and it is this aspect of adventure situations which is manipulated by guides and outdoor leaders to create a sense of challenge for participants. Perception of risk is therefore highly variable and depends on factors such as skill, previous experience and personality characteristics such as timidity and fearlessness (Priest, 1990). Similarly, perceived competence is a personal assessment of one's ability to successfully meet a situational risk (Priest, 1992)

and depends on such factors as past experience, skill level, knowledge and personal efficacy (Ewert & Hollenhorst, 1989). The interaction of perceived risk and competence is central to the perception of adventure in any situation (Martin & Priest, 1986), and as previously stated, most likely affects mood during the recreational engagement.

The literature review indicates that in order to understand better the complexity and richness of leisure experiences, it is necessary to study the immediate responses of recreationists to the changing character of leisure contexts. A key area in which such research is lacking is the person-environment transaction in outdoor leisure settings. A growing body of research suggests that mood states and an individual's focus of attention are useful indicators of the character of the nature-person transaction, and that particularly in outdoor adventure contexts, individual perceptions of risk and personal competence are important in influencing the character of this transaction. A major issue in this area of research is the extent to which recreationists in various nature-based recreational encounters focus on nature, attain high quality recreational states (i.e., positive moods), and achieve the connections to nature highly valued by prominent nature philosophers.

## Methods

### *Study Site and Sampling*

The study site was Waitomo, a well-known tourist cave system in the North Island of New Zealand. The specific adventure experience is known as black-water rafting and consists of a three-hour trip walking and floating on a rubber tube through an underground stream. The study participants were an undergraduate class of 28 students who made the trip in October 1997, early spring in New Zealand.

Data were collected at five survey sites during the black-water rafting experience using the Experience Sampling Method (ESM) developed by Csikszentmihalyi and associates (Csikszentmihalyi & Larson, 1987; Larson & Csikszentmihalyi, 1983). The ESM has the advantage of providing a real-time report on environmental context, feelings and activities, and suffers less from the well recognized deficiencies of other verbal reports (e.g., memory decay, reconstruction, socially desirable responses, overgeneralization and illusory correlation) (Borrie & Roggenbuck, 1995). It typically involves detailed monitoring of respondents' daily behavior through the use of pagers which are activated by the researcher on a random basis up to twelve or more times a day. One problem with this method in the leisure context is that significant events may not be captured (Wheeler & Reis, 1991). For this reason, we decided to sample those sites most likely to impact study variables of interest. These were determined through discussion with guides and a reconnaissance of the black-water rafting trip by the principal author.

The students were divided into three groups based on alphabetical class lists. Groups One and Two comprised ten and eleven persons respectively. Group Three was the smallest with only seven participants. Two adventure

guides and a university staff member who was equipped with multiple copies of the Experience Sampling Form (ESF) and pencils in a waterproof bag accompanied each group of students through the cave system. The ESFs were bound in five-page booklets, one page for each of the five study sites. The university staff member issued and collected surveys at each of the study sites.

The first survey site was in the Dressing Area where participants changed from their 'street clothes' into wet suits, waterproof boots and gloves, and donned safety helmets with battery powered headlamps. After a short drive, participants chose their 'tube' and under the supervision of the guide jumped into the stream from an elevated pontoon. They then walked approximately 500 meters to the cave entrance. The first entry into the cave was viewed as an important stage in the journey and was chosen as the second survey site (Cave Entrance). At this point, trip leaders gave participants the standard briefing on details of group management and safety. After this briefing, participants completed the second ESF. Then followed 30-45 minutes of walking and floating down the underground stream. At the end of this section, participants came to a 1.5 meter waterfall. Discussions with tour leaders and observation on a previous trip indicated that this was the major challenge of the trip for most participants. The briefing at the top of the waterfall also provided a natural break during which participants could complete the third ESF (Waterfall Jump) immediately prior to jumping into the plunge pool below the falls. Participants were offered the choice of jumping from just above the falls (1.5m) or climbing to jump from a point some 3.5 meters above the plunge pool.

After the jump participants floated gently downstream with headlights extinguished, viewing glow-worms on the roof of the cave. At one point, participants left the water briefly to traverse a number of rock ledges and view a tomo (a hole in the roof of the cave through which daylight enters the cave). The fourth ESF (Glow-worm Traverse) was completed at this point. Participants then re-entered the water and continued the float downstream, in darkness, viewing the glow-worms. After approximately 45 minutes to an hour, participants reached the point of exit of the stream from the cave, and they then climbed out of the cave and walked or floated downstream to the vehicle. The final ESF (Vehicle) was completed in the vehicle to capture the immediate recollection phase of the journey. On return to the tour operator's center, participants removed their wet suits, showered, dressed and had a cup of hot soup at the Black-Water Cafe.

During the time at the cafe, participants wrote about their black-water rafting experience. The research technician suggested that they write as if recounting the experience to a friend or member of their family who had asked them about the trip. The written accounts were collected from the participants prior to their departure.

### *Experience Sampling Form*

The age of the respondent, gender, and a measure of previous experience in outdoor adventure activities on a ten point scale varying from "Very



Little" (0) to "Very High" (9) were recorded on the front page of each participant's ESF booklet. In addition, the ESF included a mood scale, a focus of attention scale, and perceptions of competence and risk scales, one set to be completed at each of the five sites. It took about two minutes to complete a set.

The approach to the measurement of mood was taken directly from the work of Csikszentmihalyi and associates (e.g., Csikszentmihalyi & Larson, 1987) which was adapted from Nowlis (1965). This scale is a 7-point semantic differential comprised of twelve bi-polar adjectives to describe moods. The adjective pairs in this scale were alert/drowsy, happy/sad, cheerful/irritable, energetic/tired, friendly/angry, active/passive, sociable/lonely, calm/worried, free/constrained, excited/bored, clear/confused, and relaxed/tense.

The Focus of Attention scale was adapted from Borrie (1995) and included a differential rating of the degree of focus on *self, others, nature and task*. The scale consisted of a stem "How much are you focusing on each of the following," and four items: "your own thoughts and feelings?", "other people around you?", "the natural environment?", and "the task you are carrying out?" Responses were measured on a ten-point scale varying from "Not at all" (0) to "Very Much" (9).

Perceptions of *Competence* and *Risk* were measured on a ten-point scale varying from "None" (0) to "Very High" (9) using the following two items: "How would you rate your competence in undertaking this activity at this time?" and "How would you rate the level of risk for you in the activity at this time?"

### *Personal Accounts*

Personal written accounts of the black-water rafting experience were collected from participants at the end of the experience in the Black-Water Cafe. Lee et al. (1994) used a similar approach in which they had participants tape record immediate responses to a number of different participant-chosen leisure experiences over an extended period of time. Our study builds on this work in that we have undertaken an in-depth analysis of an outdoor adventure experience and combined both ESM and personal accounts to tap both the immediate context and the proximal recollected experience.

The specific purpose of the written accounts in our study was to collect summary data on the immediate post-trip recalled leisure experience. By this means, we sought to discover those sites that were personally relevant to participants, and to gain deeper insights into their feelings and perceptions at those sites.

## Analysis

### *Experience Sampling Data*

Principal Component Factor Analysis (SPSSwin ver.6.0) with Varimax rotation was used on the raw scores from the ESF to reduce the twelve mood states to a smaller number of factors. Items that uniquely loaded at 0.50 or

higher were used to define the factor. Three factors resulted from this analysis. The first of these, labelled *sociable* ( $\alpha = 0.70$ ), comprised the mood states *sociable*, *friendly*, *excited*, *cheerful* and *happy*. The second, *relaxed* ( $\alpha = 0.83$ ), was made up of *relaxed*, *calm* and *free* and the last, *aroused* ( $\alpha = 0.79$ ), comprised the mood states *energetic*, *active* and *alert*. The mood state *clear* loaded on both the factors *sociable* and *relaxed* and was omitted from further analysis. A respondent's score on each of the three factors was determined by finding his or her mean response to all the items.

Differences in responses between specific survey sites were measured by repeated measures analysis of variance (ANOVA) with survey site as a five-level, repeated measure within-subjects variable and mood states, focus of attention, and perceptions of competence and risk as dependent variables. Scheffe tests ( $p = 0.05$ ) were used for post-hoc comparisons of sites.

### *Analysis of the Personal Accounts*

In this study, we were particularly interested in understanding the person-nature transactions during the black-water rafting experience. The personal written accounts were an important supplementary source of this information. Data analysis involved an initial reading of all 28 participants' written accounts to develop a number of preliminary coding categories (e.g., conceptualization of nature, perceptions of risk, feelings) related to participants' responses to specific cave contexts (e.g., the Waterfall Jump or the Cave Entrance). These preliminary categories were progressively modified and refined by a number of passes through the data. For example nature themes were further expanded to indicate the character of the conceptualization (e.g. physical, aesthetic, amazing, beautiful). The site specific commonality and diversity of the coding categories was analyzed by using the 'Method of Agreement and Difference' (Neumann, 1994, p. 413). This approach involved a tabulation of the various coding categories against the participant's code number which enabled the identification of those categories which were common to many participants. This same process allowed the identification of coding categories that were more distinctive of individual responses.

## Results

Participants in this study were 28 University students in the third year of a degree in Leisure Studies at the University of Waikato in New Zealand. The students undertook the Black-water Rafting trip as part of their course. The number of males and females in the study sample were equal, the average age of the participants was 23 years. They were generally "somewhat" experienced in outdoor adventure activities (Mean = 4.30), and only one person had undertaken the black-water rafting trip previously.

### *Moods*

The mood factor with the highest overall mean value was *sociable* (Mean = 6.1), followed by *aroused* (Mean = 5.5) and *relaxed* (Mean Score = 5.2). Repeated measures analysis of variance indicated that the mood factors, *relaxed* and *aroused*, demonstrated significant variation with phase of the experience (Table 1). On the other hand, the mood factor *sociable* did not vary significantly throughout the experience.

On entering the Cave, feeling *aroused* increased, but was significantly higher (Table 2 and Figure 1a) from the Dressing Area only at the Waterfall Jump, where it attained its maximum value (Mean = 6.1:  $p < .05$ ). The mood factor *relaxed* was essentially similar at the Dressing Area (Mean = 4.86), Cave Entrance (Mean = 4.92), and at the Waterfall Jump (Mean = 4.51). It then rose significantly during the Glow-worm Traverse (Mean = 5.71:  $p < .05$ ), and attained a maximum (Mean = 6.00:  $p < .05$ ) at the end of the experience in the Vehicle. This indicates that participants were most tense in the part of the experience leading up to the Waterfall Jump. Subsequently, there was a significant change to a more relaxed frame of mind during the remainder of the trip. Conversely, the mood factor *aroused* demonstrated an inverse pattern to *relaxed*, rising progressively to reach a maximum at the Waterfall Jump. Thereafter it decreased to reach a minimum in the 'Vehicle'. The mood factor *sociable* remained high throughout the experience.

### *Focus of Attention*

Repeated Measures Analysis of Variance indicated that each of the focus of attention variables (*nature*, *self*, *task* and *others*) demonstrated significant variation between the data collection sites (Table 1).

*Nature* focus was essentially constant in the Cave environment (Table 2 and Figure 1b), being significantly less ( $p < .05$ ) only at the Dressing Area, and in the Vehicle at the end of the trip. Focus on *self* (Table 2) peaked at the Waterfall Jump (Mean = 5.6,  $p < .05$ ), but was significantly higher than before entry into the Cave only at the Waterfall Jump and the Glow-worm Traverse (Mean = 4.57,  $p < .05$ ). Introspecting about thoughts and feelings remained significantly higher after the cave experience (Vehicle) than it was before cave entry. Inside the Cave, focus on *task* was high, but only at the Waterfall Jump was it significantly higher than during Dressing. *Task* focus attained a maximum at the Waterfall Jump (Mean = 7.4,  $p < .05$ ), then decreased significantly, first during the Glow-worm Traverse (Mean = 5.36,  $p < .05$ ), and then again in the Vehicle (Mean = 2.78,  $p < .05$ ). Focus on *others* was constant within the Cave, appearing intermediate in value between the significantly lower (Mean = 3.61,  $p < .05$ ) and higher (Mean = 5.57,  $p < .05$ ) focus at the Dressing Area and Vehicle respectively. However, only at the Vehicle and the Dressing Area was focus on *others* significantly different.

TABLE 1  
*Repeated Measures ANOVA of Experience Indicators by Trip Location.*

Experience Indicators	Degrees of Freedom (Within-groups)	F-Value	Significance
Mood Factors			
Aroused	135	6.70	p < .001
Relaxed	135	10.73	p < .001
Sociable	135	1.91	n.s.
Focus of attention			
Nature	135	36.14	p < .001
Self	135	10.99	p < .001
Task	135	13.46	p < .001
Others	135	4.18	p < .003
Adventure			
Risk	135	27.04	p < .001
Competency	135	0.48	n.s.

TABLE 2  
*Post-hoc Analysis of Experience Indicators by Trip Location.*

Site	Dressing Area	Cave Entrance	Waterfall	Glow-worm Traverse	Vehicle	Significance
Experience Indicators	Mean	Mean	Mean	Mean	Mean	
Mood Factors						
Aroused	4.95 <sup>a</sup>	5.57	6.1 <sup>a</sup>	5.79	5.06	.003
Relaxed	4.86 <sup>a</sup>	4.92	4.51 <sup>b,c</sup>	5.71 <sup>c</sup>	6.00 <sup>a,b</sup>	.000
Sociable	5.87	6.14	6.29	6.19	6.01	.112
Focus of Attention						
Nature	1.79 <sup>a,b,c,d</sup>	6.36 <sup>b,e</sup>	7.00 <sup>c,f</sup>	7.46 <sup>d,g</sup>	3.61 <sup>a,c,f,g</sup>	.000
Self	2.25 <sup>a,b,c</sup>	4.00	5.61 <sup>a</sup>	4.57 <sup>b</sup>	5.39 <sup>c</sup>	.000
Task	5.21 <sup>a</sup>	5.61 <sup>b</sup>	7.4 <sup>a,c</sup>	5.36 <sup>c</sup>	2.78 <sup>a,b,c</sup>	.000
Others	3.61 <sup>a</sup>	5.04	4.93	4.50	5.57 <sup>a</sup>	.003
Adventure						
Risk	1.11 <sup>a</sup>	2.53 <sup>b</sup>	5.25 <sup>a,b,c</sup>	3.04 <sup>a,c</sup>	0.79 <sup>b,c</sup>	.000
Competence	6.71	6.71	6.21	7.25	7.00	.753

<sup>1</sup> Means with the same alphabetical superscripts indicate significant differences based on post-hoc Scheffe Tests (p = .05)

Figure 1a. Mood States by Trip Location

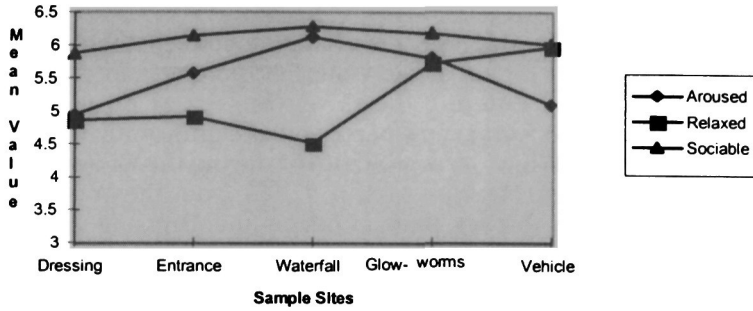


Figure 1b. Focus of Attention by Trip Location

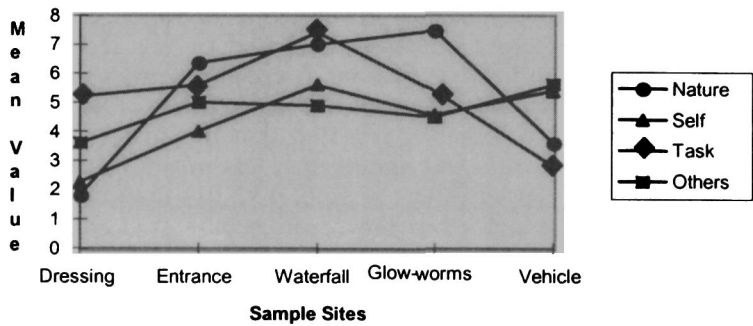


Figure 1c. Perceived Competency and Risk by Trip Location

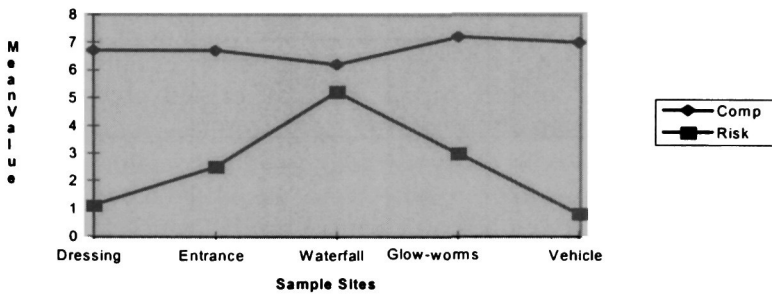


Figure 1. Variation in Experience Indicators by Trip Location.

### *Risk and Competence*

Repeated measures analysis of variance indicated that perceived *risk* demonstrated significant variation with phase of the experience. On the other hand, perceived *competence* did not vary significantly between sites (Table 1).

Perception of *risk* varied with the changing context (Table 2 and Figure 1c), being significantly higher at the Waterfall Jump (Mean = 5.25,  $p < .05$ ) than at all other sites. Entering the Cave was seen as no more risky than dressing. However, the former was perceived as significantly more risky than sitting in the vehicle. While perception of *risk* during the Glow-worm Traverse decreased significantly (Mean = 3.04,  $p < .05$ ) from the Waterfall Jump, it remained significantly higher than either at the Dressing Area or in the Vehicle.

The Waterfall Jump evoked a significantly higher perception of *risk* as compared to all the other sampled sites. Perceptions of *competence*, on the other hand, remained relatively constant throughout the trip. Although the average level of perceived *competence* exceeded the *risk* at the Waterfall (Figure 1c), analysis of the individual participant perceptions revealed a number of individuals for whom this was not the case. On this basis, the twenty-eight participants were divided into two groups, one of which comprised those individuals whose perceived *competence* matched or was less than the perceived *risk* ( $n = 15$ ) and the remainder (perceived *competence* greater than perceived *risk*) made up the second group ( $n = 13$ ).

One-way Analysis of Variance revealed that the first group (perceived *competence*  $\leq$  perceived *risk*) was significantly less *relaxed* (Mean = 3.62,  $p < .001$ ) and more *task* focused (Mean = 8.40,  $p < .01$ ) than the second group (perceived *competence*  $>$  perceived *risk*: Mean = 5.54,  $p < .001$  and Mean = 6.31,  $p < .01$ ). However, the groups did not differ significantly in the other mood factors (*sociable* and *aroused*) or in *nature*, *others* and *self* focus. This suggests that those participants who perceived a higher level of challenge in the task provided by the natural context were significantly less *relaxed* and more *task* focused than their less challenged counterparts.

In summary, we found that significant variation occurred in two of the three "Mood Factors", in all the 'Focus of Attention' variables, and in perceived *risk* as the context of the experience changed. However, apart from the mood variable *relaxed*, focus on *task*, and perception of *risk*, significant differences occurred principally between the experiences outside and inside the Cave. Significant variation within the Cave existed predominantly between the Waterfall Jump and the Glow-worm Traverse.

### *Personal Accounts*

In their written accounts, participants provided much information on their thoughts and feelings in situations both inside and outside the cave. However, in our paper we have chosen to focus particularly on participants' perceptions of the cave environment. Although many of the participants

specifically discussed the ESM sites in their accounts, other areas within the cave were equally the focus of attention, including the initial walk and float through the cave to the Waterfall Jump, and the first sight of the exit to the cave.

Overall, the main coding categories identified were 'feelings' (e.g., "a huge sigh of relief as we finally made it" [Tom]) 'nature perceptions' (e.g., "the cave itself was marvellous" [Sally]), and 'adventure' (e.g., "challenging aspect . . . to choose the high jump" [Kate]) and social aspects ("the group became increasingly sociable" [Wayne]).

*Feelings.* Excitement, nervousness, anxiety and anticipation were all feelings characteristic of the early part of the cave journey from the Entrance to the Waterfall Jump. For example, Michelle described her entry into the cave in this way: "descent into the cave . . . excitement was setting in." Another participant (Terri) on seeing the cave entrance for the first time wrote: "I saw the dark hole and I got really nervous." Jill recollected her passage through the first part of the cave in this way: 'we started negotiating our way down the cave . . . trying to keep up . . . stumbling over rocks, through the water . . . I remember feeling panicky on several occasions . . . being in such an unfamiliar environment made me feel very anxious . . . anxiety made it exciting and rewarding.' At the Waterfall Jump itself Kathy recounted her thoughts and feelings in this way: "I thought I would be gutsy and do the high jump . . . standing up there I was very nervous and scared." Post-jump feelings varied and included relief, ("I found (the jump) a bit nerve-wracking but survived" [Terri]), euphoria, ("it was a real buzz . . . I may even be able to do a bungy jump now" [Kathy]), and achievement, ("I'm not great at jumping from heights . . . a sense of achievement" [Kate]).

In contrast, the Glow-worm traverse was characterized by feelings of relaxation and enjoyment in contemplation of nature. Yvonne recollected; "the glow-worms were amazing like a sky full of stars. I felt peaceful and calm . . . enjoyed the moment." Kirsty said "turned off our lights and floated down the river . . . relaxing feeling."

The sight of the Cave Exit was associated with a mixture of relief and disappointment. Lyn recollected "it was a welcome sight to see the 'light at the end of the tunnel'. At the same time it was disappointing for the trip to end." For many, given the time of year and the cold water, a sense of relief was associated with the realization that they would soon be warm again. Lisa, for example, said "I was so glad to be finished because I was so cold."

*Nature Perceptions:* Physical characteristics of the natural environment of the cave were the dominant sub-category. Kirsty said "snapped back to reality . . . the waterfall jump . . . the highest spot . . . it was incredible". Another respondent (Phillip) wrote "the natural serenity . . . the glow-worms, still water . . . pitch blackness," and Lorraine commented "for about an hour . . . freezing cold water through some very black moments."

Almost all participants mentioned natural aspects of the cave, particularly in the early part of the cave journey, during the Glow-worm Traverse, and on sighting the Exit. However, comments indicated that individuals per-

ceived nature in a variety of different ways. For example, Frank expressed *amazement*, "limestone formations and features were amazing" and another (Yvonne), *appreciation*, "the sunny exit waiting . . . it was a ferny little cove bathed in an especially golden light." Still others wrote about *timelessness*, "all sense of time is lost . . . difficult to recall the sequence of events" (Kate), *immersion*, "the glow-worms were simply beautiful . . . momentarily forgot the cold" (Kirsty); *mystery*, *affordance* and *threat*, "the caves were mysterious and quiet . . . the limestone was watching—allowing us to pass . . . but the cold water didn't let up . . . it reminded me how vulnerable I really was" (Yvonne), *solitude*, "felt I was alone in this magic place" (Kirsty); and *oneness*, "a sense of one's self with nature."

For some, entry into the cave evoked the idea of entering a 'new world' of natural wonders: "once inside . . . the 'other world' feeling came over me—a feeling of awe and respect." (Kate). Wayne expressed a sense of gradual familiarization and opening up to the natural features of the cave during the early part of the trip: "the first rafting part . . . increased (my) nervousness and the foreignness of the whole situation . . . the changes in cave formations became increasingly interesting and I was able to enjoy looking around . . . I felt relaxed". However, for Terri, this familiarization was finely balanced: "walking through the caves I began to feel more comfortable . . . had to go under a very low bit of rock . . . nervous again."

*Adventure:* A sense of adventure was also an important theme in comments at various places within the cave, especially in the early part and at the Waterfall Jump. Sam said "I felt like a kid exploring a new world," Bill commented "passing (under) a very low roof this was a reasonable challenge," and for Michelle, "being accepted as group leader . . . the adrenalin surged." Risk was also a significant factor for some: "there was no real risk, well I wasn't feeling anxious too much" (Kathy) and "my adventuresome spirit enabled me to take the plunge . . . it was incredible . . . the risk . . . made it even more exciting" (Kirsty).

*Social Aspects:* A sense of group bonding was expressed both in the Dressing Area and inside the Cave Entrance. For example Sam commented that "as we changed, the group became very sociable," and inside the entrance to the cave, Sally said "introductions . . . stated our feelings . . . began to feel social and comfortable". At the Waterfall Jump, while most seemed to be focusing intently on themselves, there were some who mentioned the group: "remember anxiously watching others jump" (Lee). During the Glow-worm Traverse, Lyn saw the group as a source of security: "it is also reassuring . . . that in the dark there were people around close to you." Frank, on the other hand, viewed the others as a source of disturbance: "drifting in the dark . . . I wish everybody had kept quiet."

*Summary Comments about the Experience:* The majority of participants were satisfied with the experience. For example, Michelle said, "I am feeling very calm . . . probably due to the fatigue . . . Wow . . . what an experience . . . difficult to put into words." However, because of expectations of a more exciting experience, a minority expressed some disappointment: "I felt unsatisfied with the experience . . . I wish there were some big rapids" (Sam).



Others mentioned the Waterfall Jump only in passing or not at all. Wayne, for example commented "the jump was fun and I hoped for more speed (in the flow of water)."

The personal accounts demonstrated the complexity and variety of feelings and perceptions which characterized this leisure experience. As Kirsty expressed it in her summary of the experience: "the adventure was amazing—to experience so many emotions was overwhelming . . . one trip I will never forget".

### Discussion

This study focused on the person-environment transaction during an adventure recreation experience involving participants negotiating a stream within a cave system. One purpose of the study was to explore the character and degree of variation in mood states, focus of attention, connections with nature, and perceptions of risk and competence in specific contexts provided by the cave environment

#### *Person-Environment Transaction*

Underlying this research endeavor is the contention that there is a transaction among environmental context, mood states, focus of attention and perceptions of risk and competence which shapes the character and quality of the experience. The environment, in a sense, forms a frame within which individuals have the power to create their own experiences (Williams, 1986). Our data clearly support this notion, as demonstrated by variation in the key variables with the changing environmental context. The personal accounts of participants also add weight to this interpretation.

The Waterfall Jump emerged as a particularly influential site where, in general, participants felt significantly more at risk and were significantly less relaxed and more focused on task. In addition, this same site was a particularly tense and task focused situation for those who perceived their competence as matching or being less than the risk they perceived in the situation. These participants experienced states of 'peak adventure' or 'misadventure' respectively (Martin & Priest, 1986), and were aroused optimally or, in the latter cases, perhaps over-aroused (Ellis, 1973). Personal accounts of participants characterized this site as one where attention was focused mainly on the physical challenge of the waterfall. The adventurous nature of the situation induced feelings of nervousness and excitement in most, but not all, participants. Pleasant feelings of achievement, euphoria and relief replaced the less pleasant but exciting nervousness. Some deviation from this general pattern of responses was evident in individual cases and appears to be attributable mainly to expectations that the trip would be more challenging.

The focus on task and perceptions of risk resulted in a mix of nervousness, apprehension and excitement which was reflected in the variation in intensity of the mood factors *relaxed* and *aroused*. This is in accordance with

previous research in similar situations where 'fear' was a significant feeling experienced by parachutists (Klausner, 1967) and abseilers (Scherl, 1990). Some of the participants expressed mildly unpleasant feelings, and this seems more similar to previous reports of 'apprehension' in white-water rafters (Arnould & Price, 1993), and 'nervousness' or 'disappointment' in other outdoor activities (Lee et al., 1994).

Past leisure theorists and researchers have suggested that the travel back phase of the experience is most likely to exhibit a significant drop in feelings of leisure (Clawson & Knetsch, 1966; Hammitt, 1980). We generally did not find this in our measure taken in the Vehicle as participants travelled back to the outfitter's base camp. Also, levels of *arousal* and *sociable* remained at an intermediate level, and *relaxation* reached its highest level during this phase.

Finally, like Hammitt (1980) and Hull et al. (1992), we found that some aspects of mood did not change during the course of the recreational engagement. In our case, participants had no statistically significant change in *sociable* scores during the black-water rafting adventure.

Although the particular attributes of the sites undeniably influenced the character of the person-environment transaction, in common with previous research (Hammitt, 1980; Hull & Michael, 1995; Hull et al., 1992), certain patterns of change were evident with time and phase of the trip. For example, a gradual process of familiarization, with time in the cave environment, was evident in some of the personal accounts with participants moving from initial nervousness in the "new world" situation to being 'relaxed' or opening up to find interest in the cave environment. However, there were indications that this feeling was not particularly stable, as 'nervousness' returned when new challenging obstacles were encountered. After the Waterfall Jump and during the Glow-worm Traverse, participants in general focused significantly less on *task*, were significantly more *relaxed*, and felt significantly less at *risk*. Personal accounts indicated that the Glow-worm Traverse to the Cave Exit was characterized by feelings of relaxation, enjoyment and immersion in contemplation of nature, as participants floated in darkness gazing at the glow-worms. At this same time, however, the stressful effect of the cold gradually intruded and led to mixed feelings of relief tinged with disappointment that the trip was over, which characterized the latter part of the trip. Such effects would possibly be a common phenomenon in similar outdoor situations where environmental stress was a factor. The broad pattern of change in mood, feelings and focus prior to and after the Waterfall Jump is likely not entirely idiosyncratic. Similar patterns would also likely appear in outdoor contexts where one or a series of particularly challenging situations occurred at some point in the experience (e.g., an alpine traverse or a swift river crossing).

#### *Values of Nature*

Although *nature* focus was highest during the Glow-worm Traverse, it was not significantly higher than at any of the other sites within the cave. How-

ever, all sites inside the cave were significantly higher on *nature* focus than either at the Dressing Area or in the Vehicle at the end of the trip. The personal accounts provided further insights into the different ways in which participants perceived the natural environment of the cave.

The dominant focus of participants' comments on nature was on physical aspects of the cave environment such as the height of the waterfall, the darkness of the cave, the glow-worms and the cold. The feelings of connection and values that most participants assigned to nature seem to us to be similar to those derived by Borrie (1995) from a study of the writings of American wilderness philosophers. Appreciation, amazement, awe, and wonder at the beauty of nature, the depth beneath the surface, and the mysterious, unique features of the cave (*humility*, Borrie 1995, p. 18) were expressed at various points, including during the Glow-worm Traverse and on approaching the Cave Exit. Timelessness (Borrie, 1995, p. 29), being alone (*solitude*, Borrie, 1995, p. 31) and 'at one with nature' (*oneness*, Borrie, 1995, p. 21) were all mentioned during the cave section prior to the Waterfall Jump and during the Glow-worm Traverse. This may indicate that even during the short but personally intense nature experience of black-water rafting, relatively inexperienced individuals can glimpse the timeless values that western cultures have attributed to nature places.

These adventure experiences may be for the individuals concerned what Arnould and Price (1993) have called 'Extraordinary Experiences'. As such, the black-water rafting experience seems to share many of the characteristics of the much longer wilderness trip described by leisure theorists and the nature philosophers, including a sense of disengagement from normal life (the "new world" of the cave), group bonding and sharing, situations where tasks are real (jumping off the waterfall), feedback is direct and unambiguous (achievement, euphoria, relief), and a special sense of contact with nature.

Two broad categories of person-nature transactions were identified in the results of our study. Firstly, our study highlighted a situation in which nature is viewed as "awesome", "beautiful" and where competence is scarcely called into question. Nature is mostly viewed as benign and non-threatening, and participants are commonly relaxed and immersed in the contemplation of nature. In such situations, participants provide descriptions of and express feelings about natural contexts that are similar to those values ascribed to nature by wilderness philosophers. However, other situations were also evident where the environment presents a somewhat threatening obstacle to be overcome. Here, there is high focus on the physical characteristics of the obstacle and the risk entailed, in light of the perceived competence to successfully negotiate it. Most commonly, varying degrees of nervousness, apprehension and excitement are the result of such encounters.

In summary, our data demonstrate that person-environment transactions are rich and complex, and result in moods which vary in intensity and character as the qualities of the natural setting change. Challenging situations created mildly unpleasant feelings of nervousness and apprehension that can also be exciting and in which nature is constructed as somewhat threatening.

Perceived risk, a personal variable, affected whether responses to challenge were pleasant or unpleasant. Passive contemplation combined with low-level activity (floating through the cave in the dark) induced feelings of peace, calm and enjoyment when nature was viewed as benign and non-threatening. Each of these situations resulted in variation in the intensity of arousal and relaxation.

While we acknowledge that this study was limited to university students, and is therefore not representative of black-water rafters and adventure tourism consumers, we believe our findings merit additional work among more varied and representative populations.

### Conclusions

Our study has documented the changing feelings, moods and perceptions of participants in a commercial cave floating experience. We chose to select specific sites to analyze the changing nature of the experience rather than follow the traditional ESM practice of random interrogation of participants. This approach, while certainly more practical in the caving situation, was also theoretically more relevant to the purpose of our study which was to examine the person-nature transaction in different nature contexts. We believe that we have demonstrated the value of experiential sampling as an approach in exposing the varying character and intensity of nature encounters. Further, we suggest that a data collection process which combines immediate, contextualized measures of mood and focus of attention with post-trip narrative recollection, provides a means of better understanding the variety of personal factors that underlie participants' immediate responses to environmental influences.

Most previous research in outdoor environments has relied on post-hoc or global measures of person/nature transactions. Such an approach both fails to elucidate the complex, changing nature of these transactions and also cannot provide the contextual insights essential to the full understanding of nature experiences. The combination of targeted experiential sampling and post-hoc personal accounts provides the necessary immediate, rich, and contextualized information through which to better manage special places and enhance or protect opportunities for highly valued experiences.

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