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Risk, Competence and Adventure Tourists: Applying the Adventure Experience Paradigm to White-Water Rafters

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Abstract. The utility of the Adventure Experience Paradigm (AEP) as a framework for studying participants' experiences in a water-based adventure tourism activity is examined using a convenience sample of white-water rafters ($N = 84$) in New Zealand. Participants were grouped into challenge conditions based on their self-reports of post-adventure risk and competence. Group comparisons revealed a number of statistically significant differences on the measures of perceived fear, danger, anxiousness, and control ($p < .05$). However, the results were inconclusive for the concentration measure and no differences were evident on the boredom measure. Implications for adventure tourism operators are suggested and future research recommended.

Keywords. adventure, tourism activities, perception, experience

Résumé. La capacité de l'Échantillon de l'Expérience d'Aventure (É EP) de décrire des expériences de participants d'une activité touristique d'aventure en milieu aquatique est examinée grâce à l'usage de l'échantillon de commodité du chevron en eau vive ($N = 84$) en Nouvelle-Zélande. Les participants ont été repartis en groupes de niveaux de défi différents basés sur leurs propres compte-rendus sur les risques et la compétence de leur aventure. La comparaison des groupes a révélé de nombreuses différences, statistiquement significantes, au niveau de la peur perçue, du danger, de l'anxiété et du contrôle ($p < .05$). Cependant, les résultats n'ont pas permis de tirer une conclusion sur le niveau de concentration. Ainsi, il n'y existe aucune différence évidente au niveau de l'ennui. On propose des solutions aux prestataires du tourisme d'aventure et on recommande des recherches pour le futur.

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Mots clefs. aventure, activités touristiques, perception, expérience

In managing adventure tourism activities, operators are commonly required to meet participants' needs for both safety and adventure. This is not an easy task given the likelihood of wide disparities between novices and participants with previous experiences and higher levels of competency. Assessment, therefore, is necessary to determine whether adventure tourism operators are meeting the needs of their clients.

One model to consider for this assessment is the Adventure Experience Paradigm (AEP), which originally was proposed by Martin and Priest (1986, cited in Priest, 1992). In this model, the adventure condition is depicted according to recreationists' perceptions of risk and competence. The exploratory research reported here was designed to test the utility of this model on a sample of adventure tourists in a white-water rafting activity. Before describing the AEP model and its testing, the following section provides a brief review of relevant theoretical determinants of the adventure experience.

The determinants of adventure

From the perspective of adventure recreationists, Priest (1992) argues that "... the challenging nature of their adventure experiences comes from the interaction of situational risk and personal competence" (p. 127). It follows that adventure recreationists attempt to use their own competencies to overcome the risks faced in the adventure. In adventure tourism activities, teaching by instructors and guides can enhance the competencies of novices. Moreover, instructors have the capacity to *artificially* raise the competence of novices by managing risks—particularly those that emanate from environmental hazards. For example, novice participants might boast to others about their abilities to raft large-scale rapids, whereas in reality this would not be possible without an instructor's expertise and guidance. Nevertheless, novices' perceptions of their own risk and competence as determinants of the adventure experience has been supported in previous research (e.g., Priest, 1992; Priest & Bunting, 1993; Priest & Carpenter, 1993).

Level of risk

Allen (1980) provides a framework for understanding the types of risk inherent in adventure recreation (of which adventure tourism activities can be considered a subset). In this framework, risk is divided into that which is controllable and that which is uncontrollable. In the case of controllable risk, it is the uncertainty of success or failure in the activity that provides participants with potential psychological benefits. Where the activity is successfully completed, psychological benefits are manifested in feelings of competence and optimal levels of arousal (Zuckerman, 1991). In contrast, participants experience fear and anxiety when faced with uncontrollable risk (e.g., Ewert, 1988a). Allen summarizes the role of risk in adventure activities in stating "enthusiasm and effort may wane if an individual is absolutely certain that *success or failure* is imminent, for them, as we might say, *The Thrill is Gone*" (p. 67-68).

Role of competence

For some individuals, the impetus for risk taking behaviour is the anticipation of arousal (Jones & Ellis, 1996), escaping everyday routines and pressures (Iso-Ahola, 1989), and demonstration to others of one's characteristic leisure identity (Haggard & Williams, 1992). Other participants, however, are motivated by the desire to match a self-prescribed standard in performance. These expectations of self-efficacy will be realized when a participant has the appropriate level of competence to elicit feelings of control in the activity (Bandura, 1977).

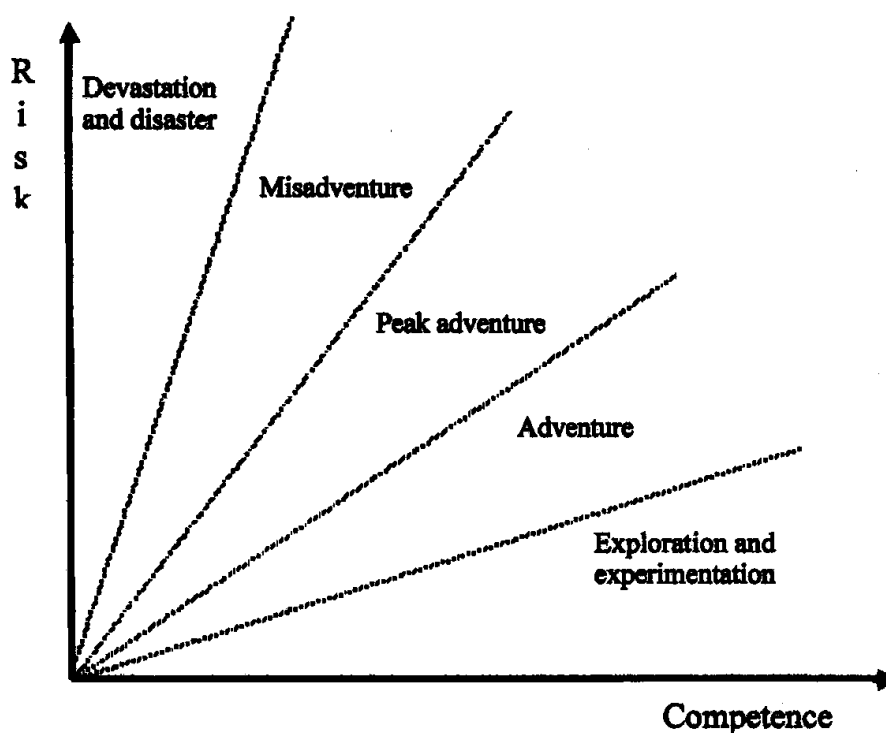
The Adventure Experience Paradigm (AEP)

In the AEP, the adventure recreation experience (operationalised as the condition of challenge) is visually defined in terms of the interaction of risk and competence (Figure 1). According to Carpenter and Priest (1989), the AEP is applicable to any leisure activity that has elements of uncertainty, regardless of whether individuals deliberately seek risks. According to Priest (1992), the AEP is "essentially a restatement" of the theories of arousal (Ellis, 1973), the concept of flow (Csikszentmihalyi, 1975) and Mortlock's (1984) spectrum of adventure "... in concert with one another" (p. 128).

Based on Ellis' (1973) work, explanations as to why individuals engage in activities surplus to their survival needs lies in arousal-seeking. As their experience broadens, individuals make more reliable pre-

dictions of behavioural outcomes. Consequently, desired arousal levels generated in subsequent behaviour becomes difficult to maintain. Priest (1992) contends that this leads participants in recreation activities to "... select levels of situational risk which suit their levels of their personal competence" (p. 128). This behavioural prediction forms the first of the AEP's conceptual foundations.

Figure 1



The Adventure Experience Paradigm (Priest, 1992).

The second conceptual foundation of the AEP is Csikszentmihalyi's (1975) theoretical model of enjoyment (illustrating the intrinsically rewarding *flow* state). In this model, the specific combinations of a participant's opportunities for action (challenges) and their capabilities (skills) are depicted. Depending on the balance, this challenge-skill match can result in the psychological outcomes of boredom, worry, anxiety, or flow. Engagement in activities that facilitate an equal balance of challenges and skills induces a flow experience (Jackson, 1996).

Kimiecik and Harris (1996) emphasize flow as the central concept of enjoyment in leisure activities by stating "... enjoyment is differ-

ent from positive affect, pleasure, attitude and intrinsic motivation. In essence, enjoyment is an optimal psychological state (flow) that leads to the pursuit of an activity for its own sake" (p. 259). Subsequent testing has refined the flow model (Csikszentmihalyi & Csikszentmihalyi, 1988), although its underlying premise has remained unchanged.

In the AEP, the challenges and skills axes of Csikszentmihalyi's (1975) flow model are replaced with risk and competence (respectively). Hence, the risk-competence balance determines the adventure experience. Priest and Carpenter (1993) assert that the risk axis captures all types of risk including physical, social, emotional, financial, and intellectual risk. Hence, the competence axis reflects a participant's skills and abilities to deal with each of these facets of perceived risk. This blend of situational risk and personal competence results in adventure participants experiencing one of the AEP's five challenge conditions. These conditions form the basis of the AEP's third conceptual foundation.

The AEP includes five challenge conditions from Mortlock's (1984) four stages of an "outdoor journey" which are based on his own experiences of teaching in outdoor adventure settings (p. 22). The challenge conditions in the AEP range from the low risk-high competence combination in "exploration and experimentation" (the *lowest* challenge condition) to the high risk-low competence combination in "devastation and disaster" (the *highest* challenge condition). Mortlock recognized that by examining participants' expressions of fear and control, he could identify each of the adventure stages (or conditions).

Studies of risk and competence perceptions utilizing the AEP

Studies testing the AEP have used similar methods and subjects. Priest's (1992) study, for example, comprised a sample ($N = 233$) of first and second year university students participating in a ropes course. This study was designed to test the Dimensions of an Adventure Experience (DAE) instrument. This instrument included direct measures of risk and competence perceptions based on separate interval scales, each interval numbered continuously from 0 (*low*) to 10 (*high*) units. Using these two scales, participants reported their perceptions of the risks inherent in an adventure activity and their perception of personal competence to deal with that risk (through circling a number on each of the scales). Priest's study and those subsequent have

applied these 11-point scales directly to the axes of the AEP (see Figure 1; e.g., Priest & Bunting, 1993, Priest & Carpenter, 1993). The actual challenge condition experienced by adventure participants was then determined through plotting their combination of risk and competence scores directly onto the AEP.

No estimates of reliability or validity have been reported for either the risk or competence scale. Moreover, it has not been empirically verified whether these scales determine, in combination, participants' adventure experiences. Priest and Bunting (1993), however, have reported a validity check by comparing individual participants' ($N = 25$) quantified challenge condition (determined by the combination risk and competence measures, as explained above) with their qualitative descriptions of the adventure. These qualitative descriptions were elicited from participants after they had studied their individual profiles of challenge as plotted on the AEP. The authors reported that all subjects agreed with their quantitatively derived profiles of the adventure, although the leading nature of this method has potential shortcomings.

Construct validity, where the correlation between two distinct and logically related measures act as expected, is commonly used to establish empirical support for underlying theoretical propositions (Babbie, 1999; McDougall & Munro, 1994). Establishing the AEP's construct validity in a range of activities and samples will provide confidence in its ability to describe participants' adventure experiences. The fact that this is yet to be done is not surprising, as limited attention has been given to the model by empirical researchers.

The purpose of this study was to test the AEP's construct validity in the context of a white-water rafting activity. Specifically, the study investigated the relationship between challenge condition (specified as the independent variable as determined through the intersection of risk and competence measures) and six perceived adventure ratings (each specified as dependent variables). The rationale used to select each perceived rating is discussed in the method section. The research hypothesis tested was: at increasingly high challenge conditions, adventure tourists' experiences of fear, danger, concentration, and anxiousness would heighten, whereas, control and boredom would diminish.

Method

Sample and research design

In collaboration with a commercial outfitter, the research was completed *in situ* (at the outfitter's river base). During this white-water rafting activity, participants paddled on a fast flowing river for two to three hours, with the opportunity to negotiate large-scale rapids (up to grade 5). Although participants were offered the choice of walking around these rapids, this was very uncommon. Rafts carried up to six participants, each under the charge and direction of an experienced river guide. Individual trips included up to five rafts.

The nature of the river and the ensuing participant experiences varied considerably with river height. Extreme conditions would often lead to trip cancellation. Additionally, trips would run only on those days when a sufficient number of participants made the activity commercially viable. Nevertheless, testing the research hypothesis required the researcher to access potential participants during or as soon as possible after the activity. This minimized the post-adventure passage of time, which may alter participants' interpretations of the experience (e.g., Lee, Dattilo, & Howard, 1994).

The research was conducted on five non-consecutive days over a three-week period. On each of these days, participants were exposed to similar river heights and weather conditions. At the first opportunity following each trip (within the hour), the researcher explained the study to each (and every) rafting participant and then requested that he/she complete a questionnaire. On completion, these were returned on-site to the researcher. In total, 91 participants were approached. There was one refusal, and three questionnaires were discarded as the risk and competence measures (detailed below) had not been completed. This produced 87 usable questionnaires with a response rate of 96%. Although this convenience sampling technique limits confidence in the sample's external validity, the researcher considered this non-random method appropriate given access limitations and the exploratory nature of this research.

Measures

Replicating previous AEP testing, participants were asked to rate their risk and competence perceptions in the activity using the questionnaire provided. Specifically, the risk question was "please indicate the amount of risk you feel applies to the activity you have just under-

taken on the scale below.” The competence question was “please rate your personal competence to deal with the risks referred to in the previous question on the scale below.” To rate risk and competence, participants circled the appropriate score on separate interval scales, each interval numbered continuously from 0 (*low*) to 10 (*high*) units (identical to those described earlier). The challenge condition, as determined through this combination of risk and competence measures, was treated as the independent variable in this study. Questions were also included to determine age, gender, place of residence, whether or not English was a first language, and if participants had done white-water rafting previously (using a yes or no format).

Measuring the dependent variables

Testing the construct validity of the AEP required an alternative measure of the challenge condition. Mortlock (1984), Priest (1992), and Priest and Carpenter (1993) provide the foundation for this measure through their descriptions of adventure participants’ psychological profiles. These descriptions related the level of fear, danger, and control experienced in specific challenge conditions. Similarly, other authors have discussed the relationship of anxiety, concentration, and boredom to challenging experiences (e.g., Allen, 1980; Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988; Ewert, 1988a).

Many of these perceived adventure experiences can be measured using published scales with established reliability and validity. Potential candidates include Ewert’s (1988b) scale of situational fear, Spielberg’s (1983, cited in Robinson & Stevens, 1990) State Anxiety Scale, and Weissinger, Caldwell, and Bandalos’ (1992) boredom in leisure time scale. These scales typically comprise large numbers of items, reflecting the multidimensional nature of the constructs being measured.

Although considered, applying these scales in this study would have required a lengthy questionnaire. This would have created potential difficulties through response fatigue, particularly considering that participants might be very weary following their adventure. Moreover, the activity operator expressed concern with participants becoming disgruntled while completing a long and detailed questionnaire, as he supposed this negative experience would reflect poorly on the company’s activity.

To offer a convenient indicator of differences among participants’ experiences across the AEP challenge conditions (i.e., from explo-

ration and experimentation to devastation and disaster), the researcher developed ordinal scales, based as close as possible to the earlier mentioned authors' descriptions of challenge. A separate scale was developed to measure participants' perceptions of six different psychological experiences; fear, danger, anxiousness, concentration, control and boredom (detailed in Table 1). After reading an explanatory statement applicable to each scale, participants circled the qualitative description applicable to their experiences on their questionnaire. Each description was set in an equal sized box, with these boxes ordered consecutively along the scale's horizontal continuum. The development of each scale is outlined below.

As discussed earlier, Mortlock (1984) described a participant's level of fear as a characterizing feature of his/her adventure stage. Applying Mortlock's stages to the AEP, Priest and Carpenter (1993) described participants' fear in the exploration and experimentation condition as being absent. In the adventure condition, participants experience "some fear," in peak (frontier) adventure "lots of fear"; and in misadventure "too much fear" (Priest & Carpenter, p. 54). The highest of the AEP's challenge conditions, devastation and disaster, involves "... major losses, neither recoverable nor acceptable, such as drowning or a permanent phobia of moving water" (Priest, 1992, p. 129). Participants would experience extreme fear in these situations.

Considering these descriptions, a five-point scale was developed to measure participant's perceptions of fear. This scale was preceded by the statement "the level of fear that I felt during the activity was." Participants then circled the appropriate categories along the continuum; response options ranged from "no fear" to "extreme fear" (see Table 1).

Fear and state anxiety are concepts that describe similar types of psychological experiences (Rachman, 1998). According to Rachman, "the term fear is used to describe an emotional reaction to a specific, perceived danger," whereas "anxiety is a state of heightened vigilance rather than an emergency reaction" (p. 2-3). Considering this, participants' anxiety perceptions were measured in terms of duration. Following the statement "during the activity I felt anxious," participants could choose a response option ranging from "never" to "most of the time" (see Table 1). The last item ("most of the time") was representative for both the misadventure and the devastation and disaster challenge conditions.

Table 1
Dependent Variable Scales and Coding

Challenge Measure	Exploration and Experimentation	Challenge Condition Adventure	Peak Adventure	Misadventure	Devastation and Disaster
Fear 5 point scale Code	No fear 1	Mild fear 2	Strong fear 3	Very strong fear 4	Extreme fear 5
Danger 5 point scale Code	Never 1	Virtually Never 2	Sometimes 3	Quite a bit 4	Always 5
Anxiousness 4 point scale Code	Never 1	Sometimes 2	Quite a bit of the time 3	Most of the time 4	
Concentration 4 point scale Code	Not at all 1	Somewhat 2	Quite a lot 3	Very much 4	
Control 4 point scale Code		All the time 1	Most of the time 2	Usually not 3	Not at all 4
Boredom 3 point scale Code	Most of the time 1	Occasionally 2	Never 3		

Mortlock (1984) contends that participant fears arise from perceptions of physical harm. Perceptions of physical harm will become manifest in participants' minds when they perceive themselves in danger. A question was therefore posed to assess participants' experiences of perceived danger during the adventure. Following the statement "during the activity I felt in real danger," respondents were presented with a choice of five categories, each generally applicable to a distinct challenge condition. The categories ranged from "never" to "always" (see Table 1).

Control and concentration are central features of Csikszentmihalyi's (1975) flow model. Csikszentmihalyi described participants' experiences of the flow condition (where the skills and challenges are equally balanced) as a merging of action and awareness through the "centering of attention on a limited stimulus field" (p. 40). This flow experience (analogous to the AEP's peak adventure condition) is associated with prolonged periods of concentration in many activities.

To measure participants' perceptions of concentration, a scale comprising four categories was drawn from Csikszentmihalyi and Csikszentmihalyi's (1988) Experience Sampling Form. Following the statement "during the activity I was concentrating," participants chose a response ranging from "not at all" to "very much" (see Table 1). The last item ("very much") was representative for both the misadventure and the devastation and disaster challenge conditions.

For Csikszentmihalyi (1975) seeking "... a sense of control is definitely one of the most important elements of a flow experience, whether or not an 'objective' assessment justifies such a feeling" (p. 46). Mortlock's (1984) descriptions indicate that a participant in both the play and adventure stage "feels in control," whereas in the frontier adventure (the AEP's peak adventure condition) "the person ... no longer feels complete master of the situation" (p. 22-23).

Considering these accounts, a four-category scale was developed to measure participants' perceptions of control. Following the question "during the activity I was in control of my situation," participants chose a response ranging from "all the time" to "not at all" (see Table 1). The "all the time" (in control) option was applicable to both the exploration and experimentation challenge condition and the adventure challenge condition.

In Csikszentmihalyi's (1975) flow model, boredom occurs when a participant's skills far outweigh the challenges at hand; therefore, per-

ceptions of boredom would not be expected in the AEP's peak challenge or in *higher* conditions. To measure perceptions of boredom, participants were asked "during the activity I felt bored," and given the response options of; "most of the time," "occasionally," and "never" (see Table 1). The rationale for only three categories was to differentiate among participants only in the experimentation and exploration, the adventure, and the peak adventure challenge conditions.

Limitations applicable to the dependent variable measures

Three general limitations pertaining to the dependent variable scales are acknowledged. Firstly, the scales are ordinal by nature. Secondly, the scales were not subject to rigorous validity or reliability checks, although a degree of face validity can be assumed from their development. However, an attempt was made to check the scales' suitability for a culturally diverse sample. This was achieved through pretesting all the variable measures on international tourists ($N = 10$) staying at a local accommodation facility, who had that day completed an adventure activity.

The pretest group included people from both Europe and Asia for whom English was not a first language. On completion, the researcher questioned each participant as to whether the scales (and words used in them) were understood. The respondents raised no major concerns in completing the scales. Following this, the researcher sketched each respondent's adventure profile onto the AEP and compared this to the responses on the dependent variable measures. This pretest fell broadly in line with what would be expected, and each scale provided a distribution of responses. In combination, these results provided the researcher with an acceptable level of confidence in the scales' nomological validity to proceed with research hypothesis testing (see, for example, McDougall & Munro, 1994).

As a third limitation, the dependent variable scales had only a limited number of items. At the extreme, the measure of boredom used only a three-item scale. Limited response choice can reduce a scale's ability to capture subtle differences among participants in subsequent statistical analysis. The decision to use scales with a limited number of items in this study was justified through the need to maintain relevance to participants' perceptions, as they related to the AEP.

Analysis

To facilitate testing of the research hypothesis—that at increasingly high challenge conditions, adventure tourists' experiences of fear, danger, concentration, and anxiousness would heighten, whereas, control and boredom would diminish—each participant was sorted into one of the five challenge groups by graphically plotting the intersection of their risk and competence scores onto the AEP (Figure 1). Following this, 23 participants were grouped as exploration and experimentation, 26 as adventure, 35 as peak adventure, 1 as misadventure, and 2 as devastation and disaster. As the number of respondents falling into the two *higher* challenge conditions (misadventure and devastation and disaster) were too few to obtain meaningful results, they were excluded from the statistical analysis.

Following this categorization and before testing the research hypothesis, measures of risk and competence were examined to check for adequate variability among the three lower challenge condition groups (i.e., for the independent variable measure). Differences among the groups for age, gender, whether or not English was a first language, and previous rafting experience also were examined to identify whether or not these characteristics were over represented in any one challenge condition (i.e., their distribution was not a chance result). Although this was not a central concern of the research hypothesis, non-chance distribution would offer potential explanations for the results of research hypothesis testing. One-way ANOVAs were used to explore the variability based on interval measures of risk, competence, and age. For the non-interval measures of gender, English as a first language, and previous rafting experience Kruskal-Wallis tests were used.

To test the research hypothesis, the dependent variable scales were coded into ordered scores (refer to Table 1). A score of one indicated the lowest level of fear, danger, anxiousness, and concentration and the highest level of control and boredom. Exploring differences among challenge groups on each of these dependent variables required subjecting the groups to the Jonckheere-Terpstra Test for ordered alternatives. This test was selected as it assumes *a priori* that groups will be ordered in a specific sequence (Siegel & Castellan, 1988). Siegel and Castellan assert that this test is more powerful than the better-known Kruskal-Wallis test for hypotheses based on the assumption of ordered alternatives. Results from one-tail probability analysis were

used to determine significance, as the research hypothesis predicts both a difference in scores and the direction of that difference on each dependent variable (Argyrous, 1996).

Where differences among challenge groups were apparent for the risk, the competence (the two measures comprising the independent variable) or the six dependent variable measures, *a posteriori* (post-hoc) methods were selected in consideration of the nature of the data and distribution patterns. In selecting appropriate tests, it was assumed that the ordinal scales used in this study provided distributions that were parametric in nature. Although non-parametric *a posteriori* methods are available for ordinal data, the application of exact parametric tests was presumed to offset any small error introduced through this assumption (see, for example, Labovitz, 1974).

Unfortunately, there is little consensus between authors regarding which *a posteriori* methods are most appropriate in different situations (Argyrous, 1996). In this study, the Scheffe method was applied to interval type data (where Levene's test for equality of the variance was not violated) as this is the most conservative *a posteriori* test available (Argyrous, 1996). Tamhane's T2 method was applied in other situations. This is a conservative t-test based comparison robust for unequal variances (SPSS, 1998). For all statistical tests, the significance level was set at $p < .05$.

Results

Sample characteristics

Participants in the sample had a mean age of 28 years ($SD = 7.8$), with 56 males (67%) and 28 (33%) females. Fifty-one participants (61%) had English as their first language with 33 (39%) having a first language other than English. Categorized by usual place of residence, 53 (63%) were from a European country (including the United Kingdom), 17 (20%) were from Australia or New Zealand, and 13 (16%) were from other regions (North America, Asia, Middle East, and the Republic of South Africa). One participant did not indicate their usual place of residence. This was the first rafting trip for 51 (61%) of the participants.

Challenge condition groupings

For the risk and competence measures reported in Table 2, each ANOVA proved statistically significant. Caution is warranted when interpreting the results on the risk measure as the assumption of homogeneity of the variances was violated (Levene's statistic 5.4, d.f. 2, $p = .007$). Tamhane's T2 *a posteriori* comparison revealed, however, that the three challenge groups were all found to be significantly different from one other on the risk measure ($p < .05$). On the competence measure, only the difference between the exploration and experimentation group and the peak adventure group proved statistically significant.

Table 2
Challenge Group Mean Risk and Competence Scores

Challenge condition	<i>n</i>	Risk ^a		Competence ^b	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Exploration and experimentation	23	1.44	0.66	8.17	1.11
Adventure	26	4.19	1.44	7.42	1.79
Peak adventure	35	6.34	1.80	6.43	1.91

Note. Risk and competence measures used 11 point scales (0 = low, 10 = high).

a one way ANOVA; $F(2, 81) = 79.10$, $p < .01$. All challenge groups significantly different ($p < .05$) from each other (based on Tamhane's T2 *a posteriori* comparison).

b one way ANOVA; $F(2, 81) = 7.66$, $p < .01$. Significant difference ($p < .05$) between exploration and experimentation group and peak adventure group (based on Scheffe *a posteriori* comparison).

Interestingly, no statistically significant differences ($p < 0.5$) were found among the three challenge groups in terms of age (one-way ANOVA, $F[2, 80] = 1.12$), gender (Kruskal-Wallis test $\chi^2[2, 80] = .01$), or whether the activity had been done previously (Kruskal-Wallis test $\chi^2[2, 81] = 1.79$). Participants with English as a first language were somewhat over represented in the adventure and peak adventure conditions (Kruskal-Wallis test $\chi^2[2, 80] = 6.75$, $p < .05$).

Testing the construct validity of the AEP

Table 3 presents summary scores for each dependent variable across the three challenge groups. An inspection of the median scores across the dependent variables revealed only a few differences among the

Table 3
Perceived Adventure Measures by Challenge Group

Challenge Group	<i>n</i>	Perceived Adventure Measures				
		Fear (1-5) ^a	Danger (1-5) ^a	Anxiousness (1-4) ^a	Concentration (1-4) ^a	Boredom (1-3) ^a
Exploration and Experimentation	23	<i>Mdn</i>	1	1	3	3
		<i>M</i>	1.18	1.50	2.73	2.82
		<i>SD</i>	0.50	0.74	0.55	0.50
Adventure	26	<i>Mdn</i>	1	2	3	3
		<i>M</i>	1.63	2.04	2.88	2.83
		<i>SD</i>	0.71	0.75	0.61	0.38
Peak adventure	35	<i>Mdn</i>	2	2	3	3
		<i>M</i>	1.91	2.06	3.09	2.91
		<i>SD</i>	0.85	0.73	0.78	0.28
Standard J-T Statistic ^a		2.84**	3.70**	3.14**	2.21*	2.57**

^a See Table 1 for scale details.

^b Based on The Jonckheere-Terpstra Test one-tail for ordered alternatives.

* $p < .05$. ** $p < .01$.

challenge groups. An examination of the mean and standard deviations provided a clearer picture of differences in central tendencies among the challenge groups though caution is warranted in the interpretation of this measure, given the ordinal nature of the data.

Applying the Jonckheere-Terpstra Test, the results reported in Table 3 indicate statistically significant differences ($p < .05$) among the three challenge groups on the measures of fear, danger, anxiousness, concentration, and control. The *a posteriori* Tamhane's T2 comparison revealed a statistically significant difference between the exploration and experimentation group and the peak adventure group on the measures of fear, danger, anxiousness, and control. On both the anxiousness and control measures, the comparison also revealed differences between the exploration and experimentation group and the adventure group. On these four measures (fear, danger, anxiousness, and control), the direction of significant differences was in accordance with those predicted in the research hypothesis. Importantly, no statistically significant *a posteriori* differences were evident among any of the three lower challenge groups on the concentration measure ($p < .05$).

Discussion and Implications

Among a convenience sample of white-water rafters, variability between the exploration/experimentation and the peak adventure groups on the independent variables (i.e., the combination of risk and competence measures) was reflected in differences on the dependent measures of fear, danger, anxiousness, and control. Hence, this finding establishes evidence for the construct validity of the AEP's underlying premise in this adventure tourism setting. Through this validation, empirical corroboration is provided for Mortlock (1984), Priest (1992), and Priest and Carpenter's (1993) descriptions of the challenge experiences of adventure participants.

The practical implications arising from this study surround the ability of adventure tourism operators to manipulate their clients' experiences of adventure. Using the AEP's simple measures of risk and competence, operators can assess whether the activity offers their clients with suitable challenges. Where the challenges result in participants experiencing intense perceived fear, operators should reduce participants' exposure to perceived danger (Rachman, 1998). Where this is not practical, guides can reduce participants' fears by having them model fearful situations (Ewert, 1988b). For example, at the start of

the trip participants can rehearse falling out of and getting back into the raft while still on flat-water river sections. The effect would be to raise participants' self-efficacy expectations and subsequent feelings of control (Bandura, 1977).

The suggestion from this study is that *checking* or reducing the challenge will neither produce boredom nor substantially lower participants' concentration levels. To remain competitive, some operators may wish to elevate participants' challenge towards the intrinsically enjoyable experience of flow (Kimiecik & Harris, 1996). This can be achieved through creating uncertainty in participants' minds about their ability to prevail over upcoming challenges. For example, guides might convey to their crew the strong likelihood of tipping during the descent of a large river rapid (raising perceived risk). The crew will then become acutely aware that only strong and precisely timed paddling (enhancing perceived competence) will ensure a successful negotiation of the rapid (eliciting feelings of control).

As demonstrated in this study, adventure tourism activities attract participants from a diverse range of backgrounds. The competencies displayed by these participants will vary and in this respect adventure tourists should not necessarily be considered a homogenous group. This study suggests that the risk-competence interplay can be used as a benchmark to investigate the contribution of personal and situational variables to the challenge experience (e.g., English as a first language). Through offering theoretical explanations as to why participants' adventure perceptions differ, adventure operators will be able to better tailor the experience of challenge to suit an activity's target market.

Limitations and Future Directions

The limitations of this exploratory study suggest a guide for further research of the AEP. Firstly, as mentioned earlier, the scales used to measure the dependent variables were not tested for reliability or validity. Considering that participants in this study emanated from a range of backgrounds, the possibility of limited English language skills among some participants amplifies concerns about the validity of each scale. Future studies should consider re-testing the AEP model using adventure measures with proven validity across culturally diverse populations.

Secondly, when participants were grouped according to challenge condition, the individual group sizes became quite small. At the ex-

treme, the numbers falling into the two higher challenge groups were not even adequate to test the research hypothesis. Future research on the AEP would require larger overall sample sizes to facilitate analysis of participants' whose adventure experiences fall into the misadventure and the devastation and disaster challenge conditions.

The third and most important limitation was that the research design captured data at only one point in time (following the adventure), although the results were assumed applicable to the dynamic adventure experienced by participants. Research methods with the ability to tap the dynamic nature of the experience have obvious advantages in this regard (e.g., Hull, Stewart, & Yi, 1992). Future studies testing the AEP should consider this while encompassing a broader range of adventure activities (in type, across settings, and in duration).

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