



## Motives for participation in prolonged engagement high-risk sports: An agentic emotion regulation perspective

Tim Woodman<sup>a,\*</sup>, Lew Hardy<sup>a</sup>, Matthew Barlow<sup>a</sup>, Christine Le Scanff<sup>b</sup>

<sup>a</sup> Bangor University, UK

<sup>b</sup> Université de Paris-Sud XI, France

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### ABSTRACT

**Objective:** To explore the agentic emotion regulation function that prolonged engagement high-risk sports (ocean rowing and mountaineering) may serve.

**Design:** In two studies, a cross-sectional design was employed. In Study 1, ocean rowers were compared to age-matched controls. In Study 2, mountaineers were compared to two control groups, one of which was controlled for the amount of time spent away from home.

**Methods:** In Study 1, 20 rowers completed measures of alexithymia and interpersonal control before rowing across the Atlantic Ocean. They were also interviewed about the emotional and agentic changes that had occurred as a consequence of completing the ocean row. In Study 2, 24 mountaineers and the two control groups ( $n = 27$  and  $n = 26$ ) completed measures of alexithymia and interpersonal agency.

**Results:** In both studies, high-risk sportspeople had greater difficulty in describing their emotions. The lowest interpersonal agency was in loving partner relationships.

**Conclusions:** Participants of prolonged engagement high-risk sports have difficulty with their emotions and have particular difficulty feeling emotionally agentic in close relationships. They participate in the high-risk activity with the specific aim of being an agent of their emotions.

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### High-risk sport

A sport is typically considered “high-risk” if the consequence of something going awry is life threatening. As such, although there are likely many more injuries in a sport such as soccer than in bungee jumping or skydiving, it is the latter that are normally classified as high-risk. All high-risk sports are typically classified as a single category (e.g., mountaineering, skydiving, hang gliding, paragliding, automobile racing, white-water kayaking, motocross riding, downhill skiing, BASE jumping, bungee jumping; see also Zuckerman, 2007), despite there being considerable diversity between many of these activities. For example, although both are considered high-risk sports, bungee jumping and mountaineering have little in common. The bungee jumper can participate with minimal preparation in a rather passive fashion with no previous experience. The activity lasts approximately one minute and involves a large percentage of thrill. In contrast, expeditionary

mountaineers need to spend much time carefully planning and organizing an expedition. This can last several weeks or months and the activity involves a large percentage of toil and hardship, as illustrated in the following quote:

What I was doing up here [climbing Mount Everest] had almost nothing in common with bungee jumping or skydiving or riding a motorcycle at 120 miles per hour. The ratio of misery to pleasure was greater by an order of magnitude than any other mountain I'd been on; I quickly came to understand that climbing Everest was primarily about enduring pain and ... subjecting ourselves to week after week of toil, tedium, and suffering (Krakauer, 1997, p. 136).

Given the contrasting characteristics of different high-risk sports, it seems likely that researchers may have over-simplified a complex question by classifying high-risk sports as a single category of activities. As Leon, McNally, and Ben-Porath (1989) stated, “individuals who seek out highly organized challenges that include a significant element of risk may be quite different from the daredevil, sensation-seeking adventurer whose gratification comes primarily from the danger itself” (p. 163). There are relatively few empirical psychological studies that are devoted to the category of “highly organized challenges” (Breivik, 1996, Butcher & Ryan, 1974;

\* Correspondence to: Tim Woodman, School of Sport, Health, & Exercise Sciences, Bangor University, Gwynedd LL57 2DG, UK. Tel.: +44 1248 382 756; fax: +44 1248 371 053.

E-mail address: [t.woodman@bangor.ac.uk](mailto:t.woodman@bangor.ac.uk) (T. Woodman).

Delle Fave, Bassi, & Massimini, 2003; Leon et al., 1989) and, to the best of our knowledge, none have specifically investigated the emotion regulation function that such challenges may serve. We aim to bridge this gap here. In the present study we chose to investigate two prolonged engagement high-risk activities for which the motives appear to lie beyond simple thrill seeking: Ocean rowing and mountaineering. *Ocean rowing* requires people to row across an Ocean (e.g., the Atlantic Ocean) aided only by oars and Ocean currents. To cross the Atlantic Ocean in a rowing boat typically takes 5–12 weeks. The dangers include: not being detected by large ocean-going vessels; wildlife (e.g., sharks); man overboard; and various ailments (e.g., deep septic blisters; dehydration). *Mountaineering* most often involves an attempt to attain a high point in a remote area of mountainous terrain, which can require days, weeks, or months of walking and climbing, typically with no external aid. The dangers include falling (off a mountain face, into a crevasse), avalanches, rock fall, hypothermia, and frostbite, all of which can result in serious injury or death.

### Sensation seeking

According to Zuckerman (1994), “the goal of sensation-seeking behavior is the increase rather than the decrease of stimulation” (p. 3). Sensation seeking has long been established as a correlate of engagement in high-risk sport (e.g., Arnett, 1994; Cronin, 1991; Fowler, von Knorring, & Orelund, 1980; Jack & Ronan, 1998; Levenson, 1990; Rowland, Franken, & Harrison, 1986; Zuckerman, 1983, 1994, 2007). Studies have typically revealed that those engaged in high-risk sports are higher in sensation seeking, especially in the factor of thrill and adventure seeking. However, as highlighted earlier and elsewhere (e.g., Lester, 2004), some high-risk sports do not reflect thrill seeking. In fact, some prolonged engagement high-risk physical activities (e.g., Ocean rowing, mountaineering) reflect something that is seemingly antonymic to thrill seeking and certainly more akin to experience seeking of a different sort; one that reflects a long and arduous battle with the elements and the self (see Lester, 2004). Furthermore, and more importantly, the sensation-seeking model does not attempt to measure motives for engagement; it measures the desire or propensity to engage in sensation-seeking activities. As such, it would be unsurprising and uninformative to reveal that high-risk sportspeople had a desire or a propensity to engage in so-called sensation-seeking activities more than people who do not engage in such activities; by definition, they already engage in such activities. The present research aims to explore motives that underlie the engagement in those high-risk sports that specifically fall into the category of prolonged engagement organized challenges or events.

### Agentic emotion regulation

Alexithymia is a difficulty in identifying one's emotions and in expressing them to others (Sifneos, 1972; Taylor, Bagby, & Parker, 1997). It is a stable trait (Luminet, Rokbani, Ogez, & Jadoulle, 2007; Mikolajczak & Luminet, 2006) that is related to poor emotion regulation, which is the process of initiating, maintaining, and modulating the occurrence, intensity, or duration of emotions (Thompson, 1994). The alexithymic difficulty in interpreting emotional signals, and the concomitant poor emotional communication, frequently hampers interpersonal relationships (Taylor et al., 1997). Although there is now some evidence that people may engage in high-risk sports activities for emotion regulation purposes (e.g., Cazenave, Le Scanff, & Woodman, 2007; Le Scanff, 2000; Levenson, 1990; Shapiro, Siegel, & Scovill, 1998; Taylor & Hamilton, 1997; Woodman, Cazenave, & Le Scanff, 2008;

Woodman, Huggins, Le Scanff, & Cazenave, 2009), the role that agency plays has yet to be explored.

In his extensive review of the mountaineering literature, Lester (2004) proposed that one of the motives for mountaineering is the desire to feel agentic, to feel as “a force expressing itself, rather than a pawn of other forces” (p. 94). Personal agency is a complex dynamic and interactive system that allows an individual to be both responsive to an ever-changing environment and proactive in determining that environment (Bandura, 1997). The most central and pervasive mechanism of personal agency is individuals' belief regarding their capabilities to exercise control over events that affect their lives (Bandura, 1989, 2001). There is scant literature on Ocean rowing, but for mountaineers the domain in which this struggle for personal agency appears to be the greatest is interpersonal relationships, particularly those of a romantic nature. For example, in his study of a successful Everest expedition, Lester (1983) observed that certain aspects of domestic life, specifically meaningful interpersonal romantic relationships, “were more stressful to the average team member than were the icy conditions in a fragile tent on a snowy ridge in a high wind with inadequate oxygen” (p. 34). This position is further supported by research on Everest ascendants and Antarctic explorers, who showed a lack of interest in social interaction for its own sake, and a low felt need for intimacy or affection; they also sought less sympathy, protection, love, or reassurance from other people than age-matched controls (Butcher & Ryan, 1974; see also Leon et al., 1989; Lester, 1983, 2004).

The prolonged engagement high-risk sports person likely chooses the stress, toil, and tedium of prolonged exposure to the high-risk environment as an attractive alternative to the perceived prolonged stress, toil, and tedium of interpersonal relationships. The attraction of the prolonged engagement high-risk domain is that it enables people to initiate and modulate their own emotional expression rather than perceiving that this is dictated by others in their relationships. In other words, it is in such high-risk domains that the person can escape the perceived stress, toil, and tedium of relationships by acting in an emotionally agentic fashion (cf. Lester, 2004).

In summary, the high-risk domain provides the opportunity for alexithymic individuals to initiate their emotions and to be an agent of these emotions; difficulty with emotions is likely a motive for engagement in high-risk sport. This is the theoretical position for the two studies reported here. Specifically, we hypothesize that individuals engaged in prolonged engagement high-risk sport will exhibit greater difficulty expressing emotions and have lower perceptions of agency within relationships, especially those of a romantic nature. In Study 1 we sought to test this theoretical framework by investigating transatlantic rowers' difficulty with their emotions, especially in those relationships that are typically the most emotional (i.e., loving partner relationships). Furthermore, if rowers engage in the sport for emotion regulation and agency purposes one would expect their perceptions of emotion expression and agency to increase after participating. The hypotheses are thus that transatlantic rowers will have a low sense of agency and a difficulty identifying and expressing their emotions and that they will perceive these limitations to improve as a consequence of rowing across the Atlantic Ocean.

### Study 1

#### Participants

Twenty (18 men; 2 women) transatlantic rowers ( $M_{\text{age}} = 35.10$ ,  $SD = 9.43$ ) took part in the study. Participants were aiming to cross the Atlantic Ocean from the Canary Islands (West Africa) to the Caribbean island of Barbados in a rowing boat without any external

aid; a journey of approximately 3000 nautical miles. Although the event is set up as a race, the primary aim for most rowers is to complete the ocean crossing. In the present sample, participants were distributed in one four-man boat, six two-person boats (five of which were men's pairs and one of which was a women's pair) and four solo boats. As is usual in this event, participants' experience varied from largely inexperienced trans-ocean rowers to relatively experienced trans-ocean rowers (e.g., attempting their third ocean crossing).

### Measures

#### Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994)

The TAS-20 is a 20-item scale that assesses three aspects of the alexithymia construct: Factor 1 is *Difficulty identifying feelings* comprising seven items (e.g., *I am often confused about what emotion I am feeling*); Factor 2 is *Difficulty describing feelings* comprising five items (e.g., *It is difficult for me to find the right words for my feelings*); and Factor 3 is *Externally oriented thoughts* comprising eight items (e.g., *I prefer to analyze my problems rather than just describe them*). Items are rated on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The three subscales can be combined to produce a total alexithymia score.

#### Spheres of control (SOC; Paulhus & Christie, 1981)

The SOC is a 30-item scale that assesses three components of perceived control: personal control, interpersonal control, and socio-political control. For the purpose of the present study, we used only the 10-item interpersonal control factor (e.g., *In my personal relationships, the other person has more control over the relationship than I do*). Each item is presented on a seven-point Likert scale from 1 (*I disagree*) to 7 (*I agree*).

Both scales have been shown to be psychometrically sound. The Cronbach alpha coefficients from the present study are presented in Table 1.

#### Pre-race interviews

The interviews were conducted primarily to provide additional in-depth information that might not easily be captured by the alexithymia and spheres of control questionnaires. The semi-structured interviews were developed, conducted, and tape-recorded by the first two authors. They were then transcribed verbatim.

The purpose of these pre-event interviews was twofold: (a) To glean, in their own words, participants' motives for engagement in this activity (e.g., *Why are you choosing to cross the Atlantic Ocean in a rowing boat?*); and (b) To complement information gathered via the SOC with more relationship-specific questions. Specifically, a limitation of the SOC measure is that its single factor for interpersonal control does not allow one to differentiate between

different aspects of an individual's interpersonal control or agency (e.g., work, friends, family, loving partner). However, a person might have a high sense of control with regard to work relationships and a low sense of control with regard to loving partner relationships, for example. We asked participants: *How confident are you in your ability to form and maintain successful and meaningful relationships?* Responses were sought from each of four relationship-specific domains (work, friends, family, and loving partner) on a Likert scale from 1 (*not at all confident*) to 20 (*extremely confident*).

#### Post-event interviews

Within two months of completing the Ocean crossing, participants were contacted with a view to taking part in a second semi-structured interview. The participants were told that the purpose of this interview was to gain an understanding of their experiences before, during, and after the transatlantic row and to assess any changes that might have taken place as a result of completing the crossing. All the interviews were conducted by the first author. Participants were asked how their perceptions of agency within the four different types of interpersonal relationships (work, friends, family, and loving partner) had changed after the row compared to before the row, if at all. After detailing their responses, participants were asked to attribute a numerical value to their answer using a scale of 1 (*much less agency than before the crossing*) through 10 (*the same agency as before the crossing*) to 20 (*much more agency than before the crossing*).

Given that we expected participants' relative alexithymia to be a motive for participating in the crossing, we further sought to capture participants' perceptions of any perceived change in their degree of alexithymia. To this end, we asked them two questions: *Compared to before the crossing, (a) how difficult is it for you to identify your emotions? (b) How difficult is it for you to describe your emotions?* We asked each participant the same questions with similar prompts in order to obtain responses that were as consistent as possible in terms of depth and complexity (Patton, 1990). Although efforts were made to ensure that the sequencing of questions was similar for each participant, the order of presentation of the questions varied slightly to allow the rowers to pursue the interview in the direction that they deemed appropriate (Patton, 1990). We classified participants simply on the basis of no change or whether they found it easier or more difficult to identify/describe their emotions in comparison to before the crossing.

#### Procedure

We contacted the organizers and rowers approximately six months before the crossing at which time the rowers agreed to participate in the study. One week before participants were due to begin their transatlantic crossing, we explained the protocol to the participants and obtained their written informed consent. We then administered the SOC and the TAS-20 followed by the pre-race interviews. Within two months of each rower's completion of the crossing, we conducted the post-race interview. Of the 20 rowers taking part in the race, two were unavailable for interview so eighteen took part in post-race interviews. At each phase of data collection, we assured participants that all data would remain anonymous.

#### Results

The qualitative component of the study was an exclusively exploratory and inductive process. That is, it was not based on any theoretical foundation and we had no intention of creating a hierarchical tree that is often associated with content analysis. For the pre-race interviews, the first author checked the transcribed

**Table 1**  
Reliability coefficients (alpha) and means (SD) and t-values of rowers' and norms' alexithymia (TAS-20) and interpersonal control (SOC) scores in Study 1.

|                                 | $\alpha$ | Rowers        | Norms         | t      | df   | Cohen's d |
|---------------------------------|----------|---------------|---------------|--------|------|-----------|
| <i>Alexithymia</i>              |          |               |               |        |      |           |
| Difficulty identifying emotions | .87      | 14.65 (5.41)  | 14.38 (5.21)  | 0.22   | 1951 | 0.05      |
| Difficulty describing emotions  | .88      | 18.00 (3.60)  | 12.50 (4.20)  | 6.71** | 1951 | 1.31      |
| Externally-orientated thoughts  | .71      | 19.05 (4.82)  | 18.70 (4.72)  | 0.33   | 1951 | 0.07      |
| Total alexithymia               | .91      | 51.70 (7.79)  | 45.57 (11.35) | 3.48** | 1951 | 0.54      |
| <i>Interpersonal control</i>    | .83      | 48.05 (10.48) | 47.70 (9.20)  | 0.14   | 193  | 0.04      |

Note. \*\* $p < .01$ .

interviews and then classified the reasons for participation into raw themes. The second author then checked each quote against each raw theme. Any disagreement was discussed until full consensus was reached. For the pre- and post-race quantitative data from the interviews, the first author simply extracted the relevant numerical values for agency (i.e., 1–20) as well as the relevant term for alexithymia (i.e., *easier*, *the same*, or *more difficult* to identify/express emotions) and the second author checked the accuracy of this extraction for each participant.

*Why are you attempting to cross the Atlantic Ocean in a rowing boat?*

In answer to this qualitative question, the two most commonly cited reasons were: (a) because of the challenge ( $n = 13$ ; e.g., *basically I like facing a challenge, it is an uphill battle... If it was easy there would be no point*); and (b) to gain a sense of achievement ( $n = 9$ ; e.g., *A sense of achievement in doing something... you don't usually do... it's a large scale project and it's something you can be proud of once you have done it*). Other reasons were: to glean a sense of recognition ( $n = 4$ ; e.g., *It would be great for people I know to know I've done it*); to satisfy a sense of adventure ( $n = 3$ ; e.g., *I fancied an adventure, as simple as that*); dissatisfaction at work ( $n = 3$ ; e.g., *Tedium at work was one of the main ones for me*); to make up for missed opportunities ( $n = 2$ ; *I've missed a lot of opportunities over the years... and I've been trying to catch up on myself... and when this came up I thought this is a great thing*); because the opportunity was there ( $n = 2$ ; e.g., *if it had been a race to the South Pole or up a mountain, we'd have done that – it's just we had the opportunity for this*); a sense of inadequacy ( $n = 2$ ; *I think essentially to resolve a sense of inadequacy and to feel like I've done something important and interesting*); an opportunity to be responsible only for oneself ( $n = 1$ ; e.g., *most things I've done in my life I've been forced into, but this is... the first time in my life that I've ever done anything which is completely based on my own choice*); and to better understand oneself ( $n = 1$ ; e.g., *I want to find a bit more about me, see what sort of person I really am*). In summary, many of the reasons given were closely related to each other and the themes of *challenge* and *achievement* were consistent.

### Alexithymia

We compared rowers' alexithymia scores with a set of normative values from an English-speaking adult population (Taylor, Bagby, & Parker, 1992; see Table 1). Rowers scored significantly higher than norms for *Difficulty describing feelings*,  $t_{1951} = 6.71$ ,  $p < .01$ . No significant differences emerged for the other factors. This pattern of results is the first indication that it is specifically the *describing* of emotions with which the high-risk sportsperson has difficulty.

Given that we expected that emotional difficulties would be one of the motives for participation, we also expected that the rowers would perceive a transitory emotional benefit from completing the crossing. The qualitative data supported this position, with nine participants reporting that they found it easier to identify their feelings and eleven participants reported that they found it easier to describe their emotions as a result of the Ocean crossing; seven reported no change. None of the participants found it more difficult to identify or describe their emotions. An example of how one rower described his increased perceived ability in expressing his emotions was:

When I was out there the emotional roller coaster was so extreme; you went from one point – you'd seen your friend going overboard which was "oh my God," that's like the lowest of the low, to the heat stroke, to speaking to the family back home, so you're back on a high again. And then coming in from the row when everyone met us and once we realised what we'd

done. I think I've probably stretched my bandwidth of emotions – I've been both sides of it now. I think that's probably made it easier [to express my emotions].

### Spheres of control

*Pre-race.* An independent means *t*-test revealed no significant difference between rowers' pre-race spheres of interpersonal control and normative scores from a population of adults (Paulhus & Van Selst, 1990; see Table 1). A single-factor repeated measures ANOVA, with Greenhouse–Geisser corrected degrees of freedom, revealed that rowers reported the lowest confidence for their intimate relationships ( $M = 13.79$ ,  $SD = 5.80$ ), although this was not significantly lower than their confidence in relationships in work ( $M = 15.39$ ,  $SD = 3.76$ ), friendships ( $M = 15.00$ ,  $SD = 3.97$ ), and family ( $M = 16.71$ ,  $SD = 3.82$ ),  $F(2.02, 30.26) = 1.71$ ,  $p = .20$ ,  $\eta^2 = .10$ .

*Post-race.* One of the aims of the post-race interviews was to assess the degree to which participants perceived that their interpersonal control had changed as a consequence of completing the race. Results indicated that participants perceived that their agency had increased across all four domains: work, friends, family, and loving partner. In line with an emotion regulation function, the largest perceived increases were in those interpersonal domains that are typically the most emotional (i.e., family and loving partner; see Table 2).

### Discussion

The rowers demonstrated significant emotion regulation characteristics for engaging in the transatlantic crossing. Specifically, they were more alexithymic than their normative counterparts; this relative alexithymia reflected a specific difficulty in describing emotions rather than a difficulty in identifying emotions. The qualitative data suggested a fairly global perceived emotional benefit, with rowers reporting a greater ease in identifying and expressing their emotions as a consequence of completing the crossing. In further support of the notion that the row serves a perceived agentic emotion regulation function, the largest perceived interpersonal agency benefits were associated with relationships that are typically the most emotional: family and loving partner relationships.

Although the data provide some initial support for the emotion regulation function of prolonged engagement high-risk sport, the study has some limitations that require attention. Perhaps the major limitation lies in the use of sample norms for comparative purposes. Although such norms provide a reasonable basis for comparison, they are limited by their inability to control for potential confounds. One such potential confound is the time spent away from home. For example, one could argue that interpersonal relationships are hampered by spending long periods of time away from home and that the concomitant relative lack of investment in home-based interpersonal relationships may itself reduce the person's sense of personal agency within these relationships.

**Table 2**

Rowers' mean (SD) change in agency for different interpersonal relationships as a consequence of completing the transatlantic row.

|                                              | Pre- to post-race change | <i>t</i> | df | Cohen's <i>d</i> |
|----------------------------------------------|--------------------------|----------|----|------------------|
| <i>Agency in interpersonal relationships</i> |                          |          |    |                  |
| Work                                         | 12.92 (3.39)             | 3.65**   | 17 | 0.86             |
| Friends                                      | 12.15 (3.16)             | 2.81*    | 16 | 0.68             |
| Family                                       | 13.39 (3.36)             | 4.28***  | 17 | 1.01             |
| Loving partner                               | 14.06 (3.56)             | 4.84***  | 17 | 1.14             |

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Change scores for agency range from 1 (*much less agency than before the crossing*) through 10 (*no change from before the crossing*) to 20 (*much more agency than before the crossing*).

In a similar vein, one could argue that individuals high in alexithymia simply choose to spend time away from home so as not to be constantly faced with difficulties in emotional expression where they matter most (i.e., at home). However, as outlined in the introduction, it is the specific prolonged engagement in emotion-inducing high-risk sport that is likely attractive to alexithymic individuals. This is because they find in this domain a means of initiating, and subsequently controlling, emotions.

In Study 2, we aimed to control for the time-away-from-home counterargument and we hypothesized that time spent away would account neither for participants' alexithymia nor for their lack of perceived agency in interpersonal relationships of a romantic nature. In order to investigate whether high-risk sport emotion regulation extends beyond Ocean rowing, the sample in Study 2 was from mountaineering. Seasoned mountaineers spend long periods of time away from home and we hypothesized that part of this would reflect emotion regulation and interpersonal agency. That is, the difficulty with emotions in relationships is such that the mountaineer feels the need to experience a sense of agency in another stressful environment: the mountains (cf. Lester, 1983). A final limitation of Study 1 that we aimed to address in Study 2 was the measurement of interpersonal agency, which we aimed to develop from the Spheres of Control and the single item used in Study 1.

## Study 2

### Participants

Mountaineer and control participants were recruited via poster adverts in a national mountaineering center (mountaineers only) or via e-mail. Given the smaller percentage of women involved in serious mountaineering, we recruited only men.

### Mountaineers

In this study we were interested in mountaineers whose interest for climbing was central to their life. In other words, we were not interested in the "weekend climber" for whom climbing was simply a form of recreational outdoor exercise. Consequently, we recruited mountaineers ( $n = 24$ ,  $M_{\text{age}} = 32.00$ ,  $SD = 3.62$ ) who had completed Alpine-type routes within the previous two years and agreed with the following statement: *Mountaineering is at the center of my existence and not just a form of welcome exercise or a chance for outdoor immersion.*

### Control groups

After incomplete questionnaires were discarded, 75 non-mountaineering participants were retained for the study. Of these, seven were removed when demographic data identified them as "risk-takers" as part of their work or leisure (e.g., policeman, stuntman). With a view to controlling for time spent away, we split the remaining 68 non-mountaineering participants into two groups: those individuals who spent long periods of time away from home (high time away controls) and those individuals who did not spend long periods of time away from home (low time away controls).

### High time away controls

We defined high time away control participants as individuals who had spent at least 40 days away from home each year for the last three years with at least one period of time greater than 21 days. This was to mirror mountaineers' pattern of time away from

home. Twenty-six participants fulfilled these criteria ( $M_{\text{age}} = 25.00$ ,  $SD = 2.57$ ).

### Low time away controls

We defined low time away control participants as those individuals who had spent less than 40 days away from home each year for the last three years with no period of time away greater than 14 days. Twenty-seven participants fulfilled these criteria ( $M_{\text{age}} = 33.00$ ,  $SD = 4.58$ ).

Those individuals who did not fulfill either of the control groups' inclusion criteria ( $n = 15$ ) were removed from further analysis.

### Measures

#### The Personal Agency in Interpersonal Relationships (PAIR) scale

To better reflect the agency within the four relationships that we were interested in, we re-worked the spheres of control scale (Paulhus & Christie, 1981) into a *Personal Agency in Interpersonal Relationships* inventory. The 10 modified and new items were rated on a five-point Likert scale from 1 (*not at all*) to 5 (*very much so*). Palenzuela (1987) found that the item *I can usually steer a conversation toward the topics I want to talk about* correlated poorly with the other items. Consequently, this item was removed from the present measure, thus yielding a nine-item measure (see Appendix). Participants were asked to respond to each of the nine items four times – once for each interpersonal relationship (family, friends, loving partner, work). Cronbach alpha coefficients are presented in Table 4.

#### The Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994)

This was the same scale as used in Study 1.

### Procedure

After we had explained by telephone the general context of the research, participants were given the option of completing the questionnaires online or on paper (which was posted to them). All participants were administered the PAIR and the TAS-20.

### Results

There was no significant between-group age difference,  $F(2, 74) = 2.18$ , ns.

#### Time spent away

A single-factor randomized ANOVA confirmed that the groups differed in time spent away from home,  $F(2, 74) = 21.76$ ,  $p < .001$ . Tukey's post hoc tests confirmed that both mountaineers and high time away controls spent a significantly greater total number of days away per year than the low time away controls (see Table 3). There was no significant difference between mountaineers and high time away controls. Furthermore, an independent samples  $t$ -test confirmed that there was no significant difference between mountaineers and high time away controls for the number of single

**Table 3**

Means (SD) for age and time away from home (for previous three years) for low time away controls ( $n = 26$ ), high time away controls ( $n = 26$ ), and mountaineers ( $n = 24$ ) in Study 2.

| Group                   | Total annual time away (days) | Periods of time away greater than 15 days |
|-------------------------|-------------------------------|-------------------------------------------|
| Low time away controls  | 43.19 (37.67)                 | 0.00 (0.00)                               |
| High time away controls | 363.00 (232.93)               | 5.38 (5.21)                               |
| Mountaineers            | 250.08 (182.92)               | 4.71 (5.43)                               |

periods of time spent away from home that were greater than 15 days ( $t < 1$ ).

#### Alexithymia

There was a significant between-group difference in alexithymia for *difficulty describing feelings*,  $F(2, 73) = 4.06$ ,  $p < .05$ . Consistent with Study 1, Tukey's post hoc tests revealed that the mountaineers had significantly greater *difficulty describing feelings* than both high time away controls and low time away controls; the two control groups did not significantly differ from each other (see Table 4). There were no significant between-group differences for total alexithymia,  $F(2, 73) = 1.95$ ,  $p > .05$ , or for *difficulty identifying feelings* and *externally oriented thoughts* ( $F_s < 1$ ). As in Study 1, the relative alexithymia of prolonged engagement risk-takers reflected a specific difficulty in *describing feelings* rather than a global emotional difficulty.

#### Agency in interpersonal relationships

There was a significant agency difference between the groups for loving partner relationships,  $F(2, 71) = 4.64$ ,  $p < .05$ . Consistent with the hypothesis, Tukey's tests revealed that serious mountaineers had significantly lower loving partner relationship agency than both control groups (see Table 4). No between-group differences were revealed for family relationships,  $F(2, 74) = 1.34$ ; or for friendships and work relationships ( $F_s < 1$ ).

### General discussion

From the emotion regulation framework developed earlier, we expected high-risk sport participants to have emotional difficulties. This was supported across both studies; both rowers and mountaineers had greater alexithymia than comparison groups even when controlling for time spent away from home. Furthermore, the specific difficulty for mountaineers in interpersonal relationship agency was in those relationships that require the most emotional expression: loving partner relationships. More support for the position that emotional difficulties may be a motive for engagement in high-risk sport was provided by rowers' perception that their emotional expression had improved as a consequence of completing the Ocean crossing. Of course, this is very likely only a short-term (perceived) and self-report benefit especially given that alexithymia is a trait deficit in emotion function (cf. Mikolajczak & Luminet, 2006). This perceived benefit does indicate, however, that the high-risk sport environment may provide an attractive perceived respite from emotional difficulty in other life domains. In particular, the relationship with nature does not require the individual to express emotions orally to others; any emotions can simply be kept private. The consistent finding that

the high-risk sport participants had specific difficulty in describing rather than in identifying their emotions supports this position and further suggests that high-risk sportsperson's emotion difficulty lies in relationships with others (rather than in relation to the self). This warrants further research, as alexithymia is most often researched as a global trait rather than in the specific context of its underlying factors (see Taylor, Bagby, & Parker, 2003). Finally, participants' declared reasons for engaging in the transatlantic row (e.g., challenge and achievement) suggest that the agentic emotion regulation motive is largely subconscious.

If high-risk adventurers spend long periods of time away from home to escape the perceived difficulty of everyday loving relationships and to experience agentic emotions, they will likely be attracted to pushing their limits to ensure renewed emotion. Such constant pushing of boundaries in a life-threatening environment could result in greater risks being taken with the potential consequences being all too clear (see also Slinger & Rudestam, 1997). However, if people engage in the high-risk domain with the specific (largely subconscious) aim of experiencing emotions of which they are the agent, there is quite likely a secondary benefit to this engagement. That is, people who return from a situation in which they have enjoyed an increase in emotion agency may experience a transfer, albeit transitory, of that agency. Specifically, an increase in personal agency in one domain may have a positive effect on personal agency in another domain to the extent that these domains have similar emotional characteristics (cf. Meichenbaum, 1996). In this respect, an increase in personal agency in the high stress domain of mountaineering, which has an inescapable romantic core (Lester, 2004), may momentarily transfer to a perceived increase in personal agency in romantic interpersonal relationships, which mountaineers experience as stressful (Lester, 1983). The increase in the rowers' perceptions of interpersonal agency as a consequence of completing the row supports this position to the degree that the largest agency benefits were in relationships of a more emotional nature (e.g., family, loving partner) than in those typically of a less emotional nature (e.g., professional). The potential for agentic emotion regulation transfer seems worthy of further empirical attention particularly if the high-risk domain can both help people develop an understanding of their emotions (cf. Cazenave et al., 2007) and allow them to successfully compensate for a difficulty in intimate relationships.

Another avenue for future research is the degree of potential conceptual interdependence between emotion regulation and agency. Indeed, agency is somewhat implied in emotion regulation. That is, effective emotion regulation is typically achieved via the initiation of actions that increase positive emotions and decrease negative emotions (Gross, Richards, & John, 2006); the emotionally regulated person is an agent in that regulation process. The converse

**Table 4**  
Mean (SD) Alexithymia (TAS-20) and Interpersonal Relationships Agency (PAIR) scores for low time away controls ( $n = 27$ ), high time away controls ( $n = 26$ ), and mountaineers ( $n = 24$ ).

|                                              | $\alpha$ | Low time away controls | High time away controls | Mountaineers                | $F$   | df    | $\eta^2$ |
|----------------------------------------------|----------|------------------------|-------------------------|-----------------------------|-------|-------|----------|
| <i>Alexithymia</i>                           |          |                        |                         |                             |       |       |          |
| Difficulty identifying feelings              | .79      | 14.92 (5.74)           | 15.85 (4.27)            | 16.91 (5.08)                | 0.95  | 2, 73 | .03      |
| Difficulty describing feelings               | .74      | 12.59 (5.12)           | 12.65 (3.12)            | 15.65 (4.26) <sup>a,b</sup> | 4.06* | 2, 73 | .10      |
| Externally-orientated thoughts               | .70      | 18.33 (5.02)           | 17.65 (4.69)            | 18.13 (5.80)                | 0.12  | 2, 73 | .00      |
| Total alexithymia                            | .76      | 45.85 (12.03)          | 46.15 (6.59)            | 50.69 (8.99)                | 1.95  | 2, 73 | .05      |
| <i>Agency in interpersonal relationships</i> |          |                        |                         |                             |       |       |          |
| Family                                       | .69      | 14.59 (4.73)           | 14.42 (4.67)            | 16.33 (4.05)                | 1.34  | 2, 74 | .04      |
| Friendships                                  | .60      | 10.56 (3.45)           | 10.42 (3.04)            | 11.12 (2.76)                | 0.36  | 2, 74 | .01      |
| Work                                         | .69      | 15.33 (5.09)           | 15.88 (3.67)            | 15.83 (2.62)                | 0.15  | 2, 73 | .00      |
| Loving partner                               | .75      | 9.76 (2.89)            | 10.04 (3.13)            | 12.39 (3.77) <sup>a,b</sup> | 4.64* | 2, 71 | .12      |

Note. \* $p < .05$ .

<sup>a</sup> Significantly different from low time away controls.

<sup>b</sup> Significantly different from high time away controls.

is not true; one can be an agent of an action without any associated emotion regulation. Thus, any association between emotion regulation and agency is likely fairly one-directional. Regardless, the emotion regulation of high-risk sportspeople appears rather more complex than one of reducing negative affect and increasing positive affect. For example, the high-risk sports person is the agent of actions that generate *negative* emotion (cf. Woodman et al., 2009). As illustrated in the Krakauer (1997) quote earlier, the prolonged engagement high-risk sport domain can be more one of pain than pleasure, and it seems that the pleasure is often more in the completion of the task than in the task itself (Assedo, 1990). The idea that pain and pleasure are so inextricably linked suggests confusion between negative and positive emotions, which reflects more anhedonia than alexithymia (cf. Loas, 2003). The degree to which high-risk sport participants confuse negative and positive emotions both in their interpersonal relationships and in the high-risk domain certainly warrants research attention.

There are of course limitations with the present study. For example, the lack of causal tests of the hypothesized relationships means future research would need to address this. For example, although alexithymic individuals may well be attracted to the high-risk domain where emotions can be expressed in a more physical fashion, it is worth exploring whether the high-risk sport domain exacerbates this personality trait by inhibiting the expression of emotions (e.g., fear). Furthermore, although alexithymia was consistently found to be associated with participation in these high-risk activities, we did not measure emotion. Recent studies (e.g., Woodman et al., 2009) suggest that alexithymic skydivers have elevated anxiety during the activity, which may seem somewhat paradoxical given alexithymic individuals' difficulty in identifying emotions. This suggests that alexithymic people simply label physical sensations as "emotion," which may help to explain why alexithymic people seek out arduous physical tasks such as transatlantic rowing and mountaineering. At the very least, researchers would do well to measure the specific emotions that are experienced within the activity but the idea that bodily expression may be a proxy for emotional expression also appears worthy of future research. Similarly, the interplay between any self-reported emotional expression benefits and the degree of corroboration from significant others warrants investigation. Specifically, we did not measure others' perceptions of rowers' perceived change in their ability to express their emotions. Given the trait characteristics of alexithymia, one may question the degree to which participants had genuinely changed and whether they would feel the need to return to the high-risk domain to renew the perceived emotional benefit. Finally, we did not measure participants' emotional expression with loving partners while they were away from home. For example, most rowers had access to a satellite phone and/or online communication during their crossing. As such, they were able to communicate with partners and family back home. Although we did not control for this, it is possible that alexithymic individuals find it easier to express emotions at such a distance and this clearly warrants further research.

In summary, adventurous high-risk sportspeople have difficulty describing emotions and feel a lack of agency in intimate relationships. They find some respite from this difficulty by actively regulating their emotions away from home in the high-risk domain. Although this emotion regulation provides an increased sense of emotional agency, any such changes are likely transitory because the underlying difficulty with expressing emotion reflects a trait deficit. As the emotion regulation has not been addressed at its core (interpersonal relationships) the high-risk adventurer will likely continue to feel a strong pull toward repeating high-risk adventures in order to feel momentary respite from other domains. The danger is that the person will take greater risks in an already

high-risk domain in search of an experience that is ever more emotionally demanding. Certainly, the degree to which people continue to take risks within this domain or eventually reconcile their emotional difficulties via such activities remains an exciting avenue for future research.

## Appendix

*The Personal Agency in Interpersonal Relationships (PAIR) scale. Items are rated on a Likert scale from 1 (I strongly disagree) to 5 (I strongly agree).*

1. In my relationships, the other person determines what happens in the relationship more than I do
2. I have trouble making and sustaining friendships/relationships
3. I'm not good at influencing the course of a conversation with others
4. I can usually develop a close personal relationship with someone I like
5. When I need assistance with something I often find it difficult to get help
6. If there is someone I would like to talk to I find it easy to approach them
7. I often find it hard to explain my point of view to others
8. In attempting to smooth over a disagreement I sometimes make it worse
9. I find it easy to play my role in most relationships

## References

- Arnett, J. (1994). Sensation seeking: a new conceptualization and a new scale. *Personality and Individual Differences*, 16, 289–296.
- Assedo, Y. (1990). De l'angoisse à la jouissance dans les conduites à risque. [From anguish to orgasm in high-risk activities]. *Revue Française de Psychologie*, 54, 121–132.
- Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994). The twenty-item Toronto alexithymia scale: I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, 38, 23–32.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175–1184.
- Bandura, A. (1997). *Self efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annual Review of Psychology*, 52, 1–26.
- Breivik, G. (1996). Personality, sensation seeking and risk taking among Everest climbers. *International Journal of Sport Psychology*, 27, 308–320.
- Butcher, J., & Ryan, M. (1974). Personality stability and adjustment to an extreme environment. *Journal of Applied Psychology*, 59, 107–109.
- Cazenave, N., Le Scanff, C., & Woodman, T. (2007). The personality and psychological profiles of women engaged in risk taking sports. *Anxiety, Stress, and Coping*, 20, 421–435.
- Cronin, C. (1991). Sensation seeking among mountain climbers. *Personality and Individual Differences*, 12, 653–654.
- Delle Fave, A., Bassi, M., & Massimini, F. (2003). Quality of experience and risk perception in high-altitude rock climbing. *Journal of Applied Sport Psychology*, 15, 82–98.
- Fowler, C. J., von Knorring, L., & Orelund, L. (1980). Platelet monoamine oxidase activity in sensation seekers. *Psychiatry Research*, 3, 273–279.
- Gross, J. J., Richards, J. M., & John, O. P. (2006). Emotion regulation in everyday life. In D. K. Snyder, J. A. Simpson, & J. N. Hughes (Eds.), *Emotion regulation in couples and families: Pathways to dysfunction and health* (pp. 13–35). Washington, DC: American Psychological Association.
- Jack, S. J., & Ronan, K. R. (1998). Sensation seeking among high- and low-risk sports participants. *Personality and Individual Differences*, 25, 1063–1083.
- Krakauer, J. (1997). *Into thin air: A personal account of the Mount Everest disaster*. New York: Villard.
- Le Scanff, C. (2000). *Les aventuriers de l'extrême. [Adventurers of the extreme]*. Paris: Calmann-Lévy.
- Leon, G. R., McNally, C., & Ben-Porath, Y. S. (1989). Personality characteristics, mood, and coping patterns in a successful North Pole expedition team. *Journal of Research in Personality*, 23, 162–179.
- Lester, J. (1983). Wrestling with the self on Mount Everest. *Journal of Humanistic Psychology*, 23, 31–41.
- Lester, J. (2004). Spirit, identity, and self in mountaineering. *Journal of Humanistic Psychology*, 44, 86–100.

- Levenson, M. R. (1990). Risk-taking and personality. *Journal of Personality & Social Psychology*, 58, 1073–1080.
- Loas, G. (2003). Alexithymie et anhédonie. [Alexithymia and anhedonia]. In M. Corcos, & M. Speranza (Eds.), *Psychopathologie de l'alexithymie*. [Psychopathology of alexithymia] (pp. 111–113). Paris: Dunod.
- Luminet, O., Rokbani, L., Ogez, D., & Jadoulle, V. (2007). An evaluation of the absolute and relative stability of alexithymia in women with breast cancer. *Journal of Psychosomatic Research*, 62, 641–648.
- Meichenbaum, D. (1996). Stress inoculation training for coping with stressors. *The Clinical Psychologist*, 49, 4–7.
- Mikolajczak, M., & Luminet, O. (2006). Is alexithymia affected by situational stress or is it a stable trait related to emotion regulation? *Personality and Individual Differences*, 40, 1399–1408.
- Palenzuela, D. L. (1987). Sphere-specific measures of perceived control: perceived contingency, perceived competence, or what? A critical evaluation of Paulhus and Christie's approach. *Journal of Research in Personality*, 21, 264–286.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.
- Paulhus, D. L., & Christie, R. (1981). Spheres of control: an interactionist approach to assessment of perceived control. In H. L. Lefcourt (Ed.), *Research with the locus of control construct* (pp. 161–188). New York: Academic Press.
- Paulhus, D. L., & Van Selst, M. (1990). The spheres of control scale: ten years of research. *Personality and Individual Differences*, 11, 1029–1036.
- Rowland, G. L., Franken, R. E., & Harrison, K. (1986). Sensation seeking and participation in sporting activities. *Journal of Sport Psychology*, 8, 212–220.
- Shapiro, R., Siegel, A. W., & Scovill, L. C. (1998). Risk-taking patterns of female adolescents: what they do and why. *Journal of Adolescence*, 21, 143–159.
- Sifneos, P. E. (1972). The prevalence of "alexithymia" characteristics in psychosomatic patients *Topics of psychosomatic research*. Basel, Switzerland: S. Karger.
- Slanger, E., & Rudestam, K. E. (1997). Motivation and disinhibition in high risk sports: sensation seeking and self-efficacy. *Journal of Research in Personality*, 31, 355–374.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. (1992). The revised Toronto alexithymia scale: some reliability, validity, and normative data. *Psychotherapy & Psychosomatics*, 57, 34–41.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (1997). *Disorders of affect regulation: Alexithymia in medical and psychiatric illness*. Cambridge, England: Cambridge University Press.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (2003). The 20-item Toronto alexithymia scale IV. Reliability and factorial validity in different languages and cultures. *Journal of Psychosomatic Research*, 55, 277–283.
- Taylor, R. L., & Hamilton, J. C. (1997). Preliminary evidence for the role of self-regulatory processes in sensation seeking. *Anxiety, Stress, and Coping*, 10, 351–375.
- Thompson, R. A. (1994). Emotion regulation: a theme in search of definition. In N. A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations* (pp. 25–52). Chicago: University of Chicago Press.
- Woodman, T., Cazenave, N., & Le Scanff, C. (2008). Skydiving as emotion regulation: the rise and fall of anxiety is moderated by alexithymia. *Journal of Sport & Exercise Psychology*, 30, 424–433.
- Woodman, T., Huggins, M., Le Scanff, C., & Cazenave, N. (2009). Alexithymia determines the anxiety experienced in skydiving. *Journal of Affective Disorders*, 116, 134–138.
- Zuckerman, M. (1983). Sensation seeking and sports. *Personality and Individual Differences*, 4, 285–292.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. New York: Cambridge University Press.
- Zuckerman, M. (2007). *Sensation seeking and risky behavior* (pp. 73–106). Washington, DC: American Psychological Association.