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SUBJECTIVE EXPERIENCE AND PSYCHOLOGICAL EFFECTS OF
PARTICIPATING IN ADVENTURE EXPERIENCES:

AN EXPLORATORY STUDY

By

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Dissertation

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Subjective Experience and Psychological Effects of Participating in Adventure Experiences: An Exploratory Study

Chairperson or Co-Chairperson: Bryan Cochran, Ph.D

Adventure Experiences (AE) are used in many different types of treatment for adolescents. Two different models have been proposed to understand the different types of experiences individuals might have while participating in these activities: the Orthogonal Model of Flow (Csikszentmihalyi, & Rathunde 1993) and the Adventure Experience Paradigm (Priest, 1992). This study combined these two models to assess the use of the psychological constructs of mindfulness and emotion regulation during the AE for individuals at different stages of the combined model. Participants were offered the opportunity to complete an AE consisting of a beginner-rated rock climb. Those who elected to participate scored higher on Behavioral Activation and lower on Behavioral Inhibition than those who declined participation in the AE. Those who completed the AE were successfully divided into flow-state groups using pre-climb ratings of challenge and skills. Individuals in the Anxiety group scored significantly lower than the other groups on subscales of flow. The Anxiety and Arousal groups scored lower than the Flow and Boredom groups on both pre and post-climb measures of self-concept. Outcome measures of self-concept and self-esteem showed significant improvement for the whole sample at immediately post-climb, but these improvements were not maintained by the 2-week follow-up. Implications of these findings and future research directions are discussed.

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Subjective Experience and Psychological Effects of Participating in Adventure
Experiences:

An Exploratory Study

Introduction

Adventure interventions have been utilized for decades as components of Wilderness Experience Programs (WEP). WEPs are defined as “organizations that conduct outdoor programs in wilderness or comparable lands for purposes of personal growth, therapy, rehabilitation, education or leadership-organizational development” (Friese, Hendee, & Kinzinger, 1998, p.40). This is a broad definition encompassing many different types of programs, which may use adventure interventions in many different ways. There are particular WEP programs with goals focused on psychological benefits and change. Wilderness therapy programs incorporate adventure experiences (AE) into psychological interventions as part of a comprehensive treatment program involving assessment, treatment, and outcome assessment (Russell, Hendee, & Phillips-Miller, 1999). Adventure-Based Counseling (ABC) is a form of wilderness therapy that focuses on specific adventure experiences and incorporates cognitive, behavioral, and affective skills to initiate positive change (Glass & Meyers, 2001). AEs are also used in programs focusing on leadership skills, teamwork, and building corporate camaraderie.

Empirical Studies of AE Programs

Programs utilizing AE paradigms appear to be widespread. Russell (2003) conducted a nationwide survey of outdoor behavioral healthcare programs for adolescents. He concluded that there were over 100 wilderness therapy programs operating in the United States at that time, which served over 10,000 clients. The

National Association for Therapeutic Schools and Programs (NATSAP) recognizes 164 programs including outdoor behavioral health, boarding schools and residential treatment programs utilizing outdoor recreation in therapeutic experiences (NATSAP, 2008). This number has grown significantly in recent years as these programs become more popular. Though these treatment modalities are increasingly popular, adventure therapy is not recognized as an empirically supported treatment (Chambless & Ollendick, 2001) due to the lack of empirical research on the efficacy of such programs.

Much of the research on the effectiveness of AEs used in different types of adventure therapies utilizes case study and qualitative designs. Russell and Phillips-Miller (2002) used a qualitative method to analyze the effectiveness of Wilderness Therapy and sought to determine which aspects of the therapy were most helpful. They conducted semi-structured interviews with 12 adolescents from 4 different wilderness therapy programs. Russell and Phillips-Miller looked at the adolescents' thoughts as to why they were enrolled in the wilderness programs and found common themes of school problems, drug and alcohol use, resistance to other forms of treatment, suppressed anger and emotions, and a high overall need for help. They found that themes for the effective components of these types of therapies were: physical exercise, primitive wilderness living, peer feedback, and therapeutic relationships with wilderness guides and therapists.

The therapeutic relationships were described as different from other traditional forms of therapy. Participants stated that they were more comfortable with wilderness counselors than with traditional counselors they had experienced in the past, due to the collaborative environment and the reduced stigma associated with counseling within the wilderness environment. In wilderness therapy, the counselors and facilitators participate

in challenges with the clients, creating a bond and trust between them. The removal from the typical therapeutic environment seemed to take some of the pressure off of the client to discuss problems, such that it was actually easier for them to talk openly.

Caulkins (2006) conducted a case study of 6 adolescent females in wilderness therapy. Each had been diagnosed with clinical depression, had a history of suicidal tendencies, and had previously received clinical psychological treatment. They concluded that the important outcomes from backpacking and wilderness therapy were increased self-efficacy, awareness of self, surroundings, and others, and reduced stress due to a sense of timelessness from life without a watch, calendar, cell phone, or alarm clock. Again, the participants preferred wilderness therapy to traditional clinical therapy and felt it was more effective. Neither of these two qualitative studies had any follow-up to see if the participants maintained the gains from wilderness therapy once they returned to their regular lives.

Russell (2003) criticized the research on wilderness and adventure therapies for lacking a theoretical basis, having methodological flaws, and generating results that were difficult to replicate. He emphasizes the importance of using standardized assessments to measure treatment outcomes. In his 2003 study, he assessed treatment outcomes from seven different programs using both the interviewer-based Youth Outcome Questionnaire and its self-report version. Russell compared these assessments to known inpatient sample data. He concluded that the participants had similar presenting symptoms at admission to inpatient populations, and that these symptoms were significantly reduced for most participants at discharge. He also conducted a follow-up and 12-months and reported that, on average, these outcomes had been maintained.

Finkenber, Shows, and DiNucci (1994) looked specifically at the effects of adventure-based activities and their effects on self-concept in a college sample. They found significant differences on change in self-concept scores for individuals after an adventure-education class compared to students who had taken a general health class. They also found differences in which self-concept subscales were most improved based on gender. Using the Tennessee Self-Concept Scale, men in the adventure-based class had significantly higher scores for Total Self-concept, Physical self, Social self, and Behavior subscales than men who did not complete the adventure-education class. Women had significantly higher scores for Total Self-concept, Physical self, and Personal Self in the adventure class than those in the control condition.

Parker and Stoltenberg (1995) compared self-esteem ratings for adolescents in traditional counseling, counseling plus adventure experiences, adventure only, and a control group. The adventure experience involved one day at a ropes course and one day of rock climbing and repelling. The control group was a waitlist, no-treatment condition. Parker and Stoltenberg used the Nowicki-Strickland Locus of Control scale and the Rosenberg Self-esteem Scale. They found limited support for increases of self-esteem and social skills for counseling plus adventure experience over counseling alone at follow-up. There were no significant improvements for the adventure-only and the control group. This indicates that adventure alone does not increase locus of control or self-esteem, but it may have additive value when used with counseling.

Few programs rely on AEs alone for therapeutic gains and instead use these experiences as part of a more comprehensive program involving psychoeducation, group and individual counseling, and often, general education. The first AE programs were

focused on education and building psychological strengths. These started with the Outward Bound Program, which uses adventure and service activities to develop self-confidence, concern for others, and self-awareness, as well as an understanding of and sensitivity to the environment (Greene & Thompson, 1990). The typical course is three to four weeks long and begins with physical conditioning gained by running, hiking, or swimming. Then, participants undergo technical skills training particular to the expedition they will be participating in. Next, they go on short expeditions with heavy leadership and guidance from the counselors. Finally, they embark on an extended expedition during which the participants gradually take over full responsibility for the trip. Each participant will also go out on at least one solo, which is a solitary expedition in the wilderness for up to three days. They may also spend time doing service projects, readings and discussions, and a student-planned and led expedition (Greene & Thompson). While these activities seem to promote self-esteem, leadership, and teamwork skills, there is no traditional counseling or psychotherapy involved.

Counter to the Outward Bound approach, the Santa Fe Mountain Center started as a traditional mental health clinic, later developing their AE approach (Kimball, 1990). The Santa Fe Mountain Center has specific AE programs developed for clients with diagnoses of chronic schizophrenia and autism, as well as emotionally disturbed youth, individuals convicted of sexual crimes, individuals who are victims of sexual crimes, and families in crisis. They use AEs as a type of projective assessment tool. Though these tasks are clearly presented, there are a wide array of behavioral responses possible on the part of the participant. The inherent stress of these activities tends to increase the likelihood that the client will “project unique personality characteristics onto the test

situation” (Kimball, p.12). This allows the clinician to observe behavioral patterns, dysfunctional coping strategies, intellectual processes, and emotional responsiveness. They then use the data to create therapeutic goals. They continue to use the AEs in concert with more traditional therapy techniques to instill insight, motivation, and to initiate change. The program also focuses heavily on positive psychology, particularly individual strengths and competencies.

There are many other programs based on the Adventure-Based Counseling (ABC) model. This model uses specific AEs geared toward certain lessons with the overall goal of increased self-concept (Schoel, Prouty, & Radcliffe, 1988). They use specific exercises related to trust building, dealing with challenge and stress, problem solving, and using humor and fun for teambuilding. They use theoretical ideas from behavioral, cognitive, and affective perspectives to guide their understanding of a participant’s experience in the AE. Each activity has a briefing prior to and a debriefing after the AE. Participants create clear goals for the more difficult AEs and work toward those goals. They are able to participate in multiple different activities with varying degrees of difficulty to gain competence and self-efficacy. While these techniques can be used with many different populations, without clinically trained staff, many of these programs serve at-risk youth with subclinical behavioral difficulties (Schoel, Prouty, & Radcliffe, 1988).

Different clinical conditions addressed by AEs

As there are many different types of programs utilizing AEs, there are also a variety of different populations and clinical conditions served by these programs. Many adventure programs are specifically designed for at-risk youth, which may have an array of different behavioral, emotional, academic, and family problems (Fletcher & Hinkle,

2002; Kjol & Weber, 1990; Ungar, Dumond, & McDonald, 2005). Other programs serve families and are able to use the AE as a metaphor for family dynamics, to build trust, and to give immediate feedback about interaction styles (Mason, 1987; Fletcher & Hinkle, 2002). Some programs cater specifically to women and work on eating disorders, body image, breaking female stereotypes, and addressing issues around victimization (Powch, 1994; Fletcher & Hinkle, 2002). There are programs that provide treatment for clinical diagnoses of major depression, post-traumatic stress disorder, dysthymia, anxiety disorders, borderline personality disorder (Tippet, 1990; Gass, 1993), avoidant personality disorder (Eikenaes, Gude, & Hoffart, 2006), and adjustment disorders (Fletcher & Hinkle, 2002). Other programs serve adult populations for addiction recovery (Benett, Cardone, & Jarczyk, 1998). Focusing more on building trust, teamwork, and leadership, many programs serve college students and corporate groups (Finkenberg, Shows, & DiNucci, 1994; Fletcher & Hinkle, 2002).

Despite the wide variety of programs and the populations and clinical disorders that they service, there still seem to be many problems with the literature in evaluating the efficacy of such techniques. Some of the methodological flaws that have plagued this research field include: qualitative and quasi-experimental designs (Caulkins, 2006, Davis-Berman & Berman, 1989, & Hill, 2007), lack of an adequate comparison group (Hill, 2007), limited controls (Hill, 2007; Neill, 2003), neglecting to use standardized assessments and measures (Russell, 2003; Neill, 2003), and neglecting to collect long-term follow-up data (Neill, 2003; Hill, 2007). Many of the methodological problems are due to practicalities that make empirical research difficult in these settings. Few studies have taken a dismantling approach, separating out the different components of these

treatments to determine the effectiveness and additive value of each. In particular, it is important to assess the effects of the AE alone to determine if it is a necessary component of wilderness therapies. Much of the research consists of effectiveness studies for particular programs. These results cannot be generalized to other programs, as they are all quite diverse in the services they offer and the manner in which they offer them. Therefore, it would be beneficial to assess the efficacy of aspects of these treatments alone (like AEs) that are common among many programs.

While there is limited research on the efficacy of these programs, there is, however, a relatively large and diverse body of literature on the effectiveness of different wilderness therapy and adventure therapy programs. Cason and Gillis (1994) conducted a meta-analysis of 43 studies on outcomes of wilderness programs, which indicated that adventure therapy programs are effective in improving self-concept and clinical functioning and in decreasing behavioral problems. Wilson and Lipsey (2000) conducted a meta-analysis of 28 outcome studies that employed control group comparisons. They reported an overall mean effect size of 0.18, which related to a recidivism rate of 29% for the wilderness therapy participants compared to 37% for the control groups (mostly treatment as usual). In these studies, the adolescents were juvenile offenders and the recidivism rate is based on those who reoffend. While much of this research seems promising, it is often difficult to interpret and limited in its generalizability due to the specificity of each individual program and variability between programs.

Russell (2003) asserted that the effectiveness studies of wilderness therapy in the literature “reveal consistent lack in theoretical basis, methodological shortcomings, and results that are difficult to replicate” (p. 355). Hill (2007) states that the literature has yet

to show exactly how wilderness therapy works and what type of adventure activities are associated with the best outcomes. Many researchers have proposed mechanisms of change in wilderness therapy programs, such as physical exercise, challenging experiences, wilderness setting, group interaction, spiritual growth, and therapeutic relationships with counselors and therapists (Caulkins, 2006; Russell & Farnum, 2004; Ungar, Dumond, & McDonald, 2005; and Russell & Phillips-Miller, 2002). These mechanisms are derived from case study and qualitative research. This search for the specific mechanisms of change has created a need for research focusing specifically on the therapeutic utility of AEs.

Mechanisms of Change in AE Programs

Despite a number of theoretical explanations of why AEs may work, few studies have directly tested models of the mechanisms for change involved in AEs. Following are descriptions of some of the theories about the mechanisms of change involved when individuals participate in AEs and the similarities across these theories.

Schoel, Prouty, and Radcliffe (1988) propose that the key elements in an AE are: a novel setting, challenge/stress, peak experience, and debriefing. The setting is drawing on the therapeutic qualities of nature (Miles, 1993) and the novelty may create stress from the uncertainty of what the environment may bring. This stress, combined with the fear that may be induced by the risk involved with the particular AE, can be described as eustress (Lazarus, 1974), or constructive anxiety (Nadler, 1993). This is stress that leads to motivation and an over-coming of fears, which is thought to be associated with positive psychological outcomes. When a participant is confronted with an AE that is highly challenging and perceived as risky, and s/he has a high level of skills and

perceived competence to complete the AE, s/he will have a peak experience (Schoel, Prouty, & Radcliffe, 1988).

Abraham Maslow (1968) first described peak experiences as part of self-actualization. He detailed the cognitive process during such experiences in which the individual has total attention on the activity such that virtually nothing else exists. The peak experience is described as self-validating, self-justifying, and intrinsically rewarding. It is also marked by a disorientation of time and space, a feeling of effortlessness, uniqueness, playfulness, truth, beauty, simplicity, richness, wholeness, aliveness, justice, completion, perfection, and self-sufficiency. Maslow portrayed the peak experience as necessarily positive and desirable. He described how repeated exposure to peak experiences changed an individual's general perception of the world to be less self-focused and richer in nature.

Researchers have continued to study peak experiences using various definitions and conceptualizations of what these experiences are and how they might be psychologically beneficial. These experiences have been associated with positive psychological outcomes. They are discussed below as "flow" experiences. As many participants in AEs may not have a peak or flow experience, Schoel, Prouty, and Radcliffe (1988) state that it is important to have a debriefing after the AE to help participants to learn from anxieties and failures, so that they may succeed at future AEs.

Fletcher and Hinkle (2002) discuss a framework for ABC where the key components of the AE are similar to Schoel, Prouty, and Radcliffe's and include: the setting, the element of perceived risk, being in a state of disequilibrium, macroprocessing, and debriefing. In this framework, the setting can be either indoor or outdoor, but the

authors emphasize the therapeutic qualities of nature and prefer to use an outdoor setting. The perceived risk is posited to provide “intense cognitive and emotional arousal” (p. 280). The idea is to challenge clients to try something that they believe they cannot succeed at, and then generalize their experience of success to other aspects of their lives. This assumes that most people will in fact succeed, and Fletcher and Hinkle do not discuss the effects of high levels of perceived risk in relation to failure at the AE task.

The state of disequilibrium is described as taking the client outside of her/his comfort zone, such that they will experience emotional arousal. In this state of disequilibrium, the client’s typical and likely maladaptive coping mechanisms are ineffective, and they must be taught new coping strategies by the therapist. The macroprocessing can be done in multiple ways, but the concept simply refers to how the AE is presented to the client/s and how the AE is processed therapeutically. Fletcher and Hinkle discuss how the therapist can process the AE prior to participation, after participation, both before and after participation, or not at all. Finally, the debriefing and transfer of the experience to everyday life is a discussion of the lessons learned in the AE and how they can be applied in everyday social and work settings (Fletcher & Hinkle, 2002).

The proposed key elements that are common across different conceptualizations of the use of AEs in nontraditional therapeutic processes seem to be: the outdoor/novel setting; emotional arousal caused by perceived risk, the novelty of the situation, and the lack of adequate coping strategies; and a debriefing and processing of the experience. The current research project is interested in evaluating the subjective experience of an individual during participation in an AE and the psychological effects of that experience,

separated from any other psychological interventions. Therefore, the researcher is interested in understanding and evaluating the emotional arousal associated with the novelty of the experience and the perceived risk involved. As individuals will likely have different perceptions of risk and comfort with novel settings, it is important to understand how and why individuals may have different subjective experiences while participating in the same AE. Flow theory (Csikszentmihalyi, 1975) and the Adventure Experience Paradigm (Priest, 1992) provide models for understanding the variations in experiences in challenging and risky activities.

Flow Theory

Mihaly Csikszentmihalyi (1975) developed a theory describing participants' subjective experiences in different types of activities. He coined the term "flow" to describe a state of optimal experience that people encounter when they are intensely involved in doing enjoyable activities (Csikszentmihalyi, 2000). A flow experience includes key components such as: clear goals, unambiguous feedback, a perceived match between skills and challenges, a sense of control, uninterrupted concentration on the task at hand, a merging of action and awareness, a loss of self-consciousness, and an altered sense of time, which result in an autotelic experience (Csikszentmihalyi, 1975, 1988, 1997). An autotelic experience is one that is intrinsically rewarding, such that the experience is its own reward. Csikszentmihalyi developed and utilized the experience-sampling method (ESM) to assess individuals' experiences of flow in everyday life (Csikszentmihalyi, 1988). To employ this method, Csikszentmihalyi gave participants pagers and would alert them at random times during their day to fill out measures assessing the different components of flow. In doing so, Csikszentmihalyi was

able to obtain prevalence estimates for the amount of time individuals spend in flow experiences, the number of flow experiences individuals have in a given week, the types of activities that tend to induce flow experiences, and psychological factors associated with more frequent flow experiences (Csikszentmihalyi, 1988).

Csikszentmihalyi and Rathunde (1993) found in multiple studies that individuals who experienced more flow in their everyday lives had higher ratings of self-esteem, self-efficacy, and self-concept. He also found that individuals experience flow in a variety of different activities at home, at work/school, and at leisure/recreation times. What seems to differentiate activities that induce flow from those that do not is a particular balance of challenge and skills. This led Csikszentmihalyi and Rathunde to develop the orthogonal model of flow experiences (1993).

In this orthogonal model, Csikszentmihalyi and Rathunde (1993) identify eight different channels for the analysis of experience based on a combination of level of challenge and level of skill (see Figure 1.1). If an individual is faced with a low degree of challenge and s/he has a low skill level to complete that challenge, s/he is in a state of apathy. If the individual instead has moderate skills or high skills, s/he will experience states of relaxation and boredom, respectively. In a moderate challenge situation, a low skill level will result in a state of worry and a high skill level will result in control. For a highly challenging situation, low skill level will result in anxiety, moderate skill level will result in arousal, and high skill level will result in flow. This model suggests that in order to experience a state of flow, an individual must be engaging in an activity that is highly challenging and for which s/he has a high degree of skill (Csikszentmihalyi and Rathunde, 1993).

The orthogonal model of flow can be used to describe the experiences of individuals in wilderness and adventure therapy experiences. These adventure experiences are designed to be highly challenging and novel for the majority of the participants. Thus, one would expect that an individual first entering treatment would be faced with highly challenging activities paired with a low skill level, resulting in a state of anxiety and a high probability of failing at the challenging task. If this anxiety and probable failure is dealt with in a therapeutic way, it may result in eustress or constructive anxiety (Nadler, 1993). It is also possible that this anxiety and failure could result in negative and harmful effects. These effects may reduce self-esteem and self-efficacy or fracture one's self-concept as a competent and capable person.

As the individual gains skills, s/he will move to a state of arousal. In this state, it becomes more likely that s/he can successfully complete the challenge if s/he is able to control or work through her/his arousal. Here, cognitive-behavioral skills and emotion regulation skills can be employed to help manage the arousal and optimize chances for success. If the arousal cannot be managed, it is more likely that s/he will fail the challenge and possibly suffer negative psychological consequences.

When the individual has developed a high degree of skill, s/he is expected to experience flow. This flow experience is expected to result in increased self-esteem, self-efficacy, and self-concept. The individual will also be motivated to continue participating in the activity and further challenge herself/himself, as flow is an autotelic experience. Flow can be experienced while doing a multitude of different activities, as long as that activity is highly challenging. AEs are unique in that the activity is specifically of an adventurous nature, which may make the challenge involved with AEs somewhat

different from other challenges that individuals face in their lives.

Adventure Experience Paradigm (Risk and Fear Assessment)

Priest (1992) developed a similar model, the Adventure Experience Paradigm (AEP), specific to adventure experiences. The AEP was based on Ewert and Hollenhorst's (1989) work on adventure recreation. The AEP utilizes dimensions of risk and competence instead of Csikszentmihalyi's dimensions of challenge and skill (see Figure 1.2). This difference highlights that AEs are not only typically challenging, but also involve a degree of inherent risk. The AEP describes the possible risk/competence combinations and their resulting state as: low risk with high competence is "Exploration & Experimentation," moderate risk with high competence is "Adventure," high risk with high competence is "Peak Adventure," high risk with moderate competence is "Misadventure," and high risk with low competence is "Devastation & Disaster." These dimensions map directly on to Csikszentmihalyi's orthogonal model, but seem to describe the outcome of the AE, whereas the orthogonal model describes more of a subjective, psychological experience (see Figure 1.3).

AEs are unique in that they involve some amount of inherent risk. Risk is described by Miles and Priest (1990) as the "potential to lose something of value," which can be "physical, mental, social, or financial" (p. 116). There are is real risk, which is the "true potential for loss" and can only be estimated for any given AE (p. 116). This estimate is called the "perceived risk," which tends to become more accurate with experience and may be influenced by personality styles (p. 116). Competence is a "combination of skill, attitude, knowledge, behavior, confidence, and experience" (Miles & Priest, 1990, p. 116). For the concept of competence, both real and perceived competence exists, similar

to risk.

Priest (1992) describes how a timid or fearful person tends to perceive the level of risk as higher than reality and her/his level of competence as lower than reality. In contrast, an individual who is arrogant or fearless will perceive the risk as lower, and her/his skills as higher, than reality. When an individual perceives the level of risk to be high in an AE, that person will subjectively experience fear. This fear will be greater if s/he perceives her/his competence to be low. The novelty of AE for the participants insures that most individuals will have an inaccurate perception of risk and competence before their first attempt at the AE. The nature of these AEs involving heights, water, or other challenging situations may encourage most novice participants to overestimate the degree of risk and induce a subjective fear, though the direction of misperception being over or under the real level of fear may be moderated by personality style, as described above.

Jones, Hollenhorst, and Perna (2003) compared the orthogonal model of flow with the AEP for the AE activity of whitewater kayaking. They formed orthogonal flow groups based on ratings of challenge and skills, and AEP groups based on ratings of risk and competence. They found that the group membership obtained by the two models correlated highly with one another and they both equally predicted indicators of flow, such that they seemed to be based on a similar construct. Interestingly, neither model was able to explain a very high proportion of the variance in optimal experience. In addition to flow theory and the AE Paradigm, it is possible that other psychological constructs may add better explanatory power to the therapeutic effectiveness of AEs. While these theories provide a model for understanding variance in subjective experiences during

AEs based on participants' perceptions of the AE task and their abilities to succeed, the theories do not account for the use of psychological constructs as coping strategies. As discussed above, Fletcher and Hinkle (2002) propose that AEs cause both cognitive and emotional arousal of the participant. The cognitive arousal may facilitate an experience of mindfulness, while the emotional stimulation may give rise to the use of emotion regulation techniques. The current study proposes to combine the orthogonal flow model with the AEP as Jones, Hollenhorst, and Perna (2003), but also to add measures of emotion regulation and mindfulness to help explain more of the variance in optimal experience.

Mindfulness Experiences

Mindfulness is a way of perceiving the world that has become incorporated into techniques that are increasingly popular in the field of psychology (Bishop et al., 2004). It originates from Buddhist spiritual practices, and is described as an attention to the moment-to-moment experiences of an individual (Kabat-Zinn, 1990). Mindfulness has been used in psychology to increase awareness to mental and emotional stimuli and processes while maintaining an attitude of non-judgment (Bishop et. al.). These techniques have been developed into Mindfulness-Based Stress Reduction (MBSR), which is a manualized treatment program used for a variety of emotional and behavioral disorders (Brown & Ryan, 2003). In MBSR, mindfulness is practiced in sitting meditations, yoga practices, and body scans, where individuals are taught to focus on the present experience. The orientation to the present can also be observed in everyday experience. Other adaptations of mindfulness concepts to psychological treatment include the teaching of mindfulness skills to individuals with borderline personality disorder in

Dialectical Behavior Therapy (Heard & Linehan, 1994), the emphasis on sitting with one's experience in Acceptance and Commitment Therapy (Luoma, Hayes, & Walser, 2007), and the disengagement with maladaptive thinking styles in Mindfulness-Based Cognitive Therapy (Segal, Teasdale, & Williams, 2004).

Brown and Ryan (2003) discuss the positive relationship between mindfulness and well-being. In their research, mindfulness is examined both as a dispositional attribute in everyday experiences and as a state during meditative practices. They suggest that both types of mindfulness are positively related to behavior regulation and positive emotions. Brown and Ryan infer that mindfulness practice generalizes to dispositional mindfulness, as mindfulness practitioners score higher on their dispositional mindfulness scale (Mindful Attention Awareness Scale; MAAS) with increased practice. They also assert that the capacity for mindfulness varies within persons and can be increased or decreased in different ways. Brown and Ryan suggest that flow activities may increase everyday mindfulness by encouraging mindful attention and by being intrinsically motivating.

Csikszentmihalyi's definition of flow involves components that are similar to those of mindfulness experiences. Specifically, the intense concentration on the task at hand, the merging of action and awareness, and the loss of self-consciousness seem to be similar to the experience of mindfulness. Mindfulness has been described as having two main components: self-regulation of attention and an orientation toward any experience of "curiosity, openness, and acceptance" (Bishop, et al., 2004, p. 232). The idea of self-regulation of attention relates to the concentration and merging of action and awareness in flow theory. The loss of self-consciousness is similar to the open orientation to the experience in mindfulness theory.

While mindfulness is typically studied as part of sitting meditation, its similarity to flow experiences makes it reasonable to apply theories of mindfulness to AEs. Shapiro, Carlson, Astin, and Freedman (2006) proposed three main mechanisms of the therapeutic utility of mindfulness. These three mechanisms are intention, attention, and attitude. In an AE, there is a clearly defined goal (get to the top of the rock climb, or finish the ropes course) that sets up the intention aspect. The attention is when the individual has intense concentration on the tasks of the AE. This concentration is uninterrupted by emotional content when the risks are matched with adequate competence. When the risks are perceived as greater than their competence, the emotional response must be interpreted with an open and accepting attitude in order to maintain concentration.

Brown and Ryan (2003) demonstrated that both dispositional and state mindfulness predict self-regulated behavior, where self-regulated behavior was defined as participation in activities where the locus of control resides in the individual (measured with the Perceived Locus of Causality scale). This was related to positive emotional states and overall declines in mood disturbance and stress with prolonged use of mindfulness. These findings suggest that mindfulness can be used in AEs to self-regulate emotional responses of fear in risky situations, allowing participants to successfully complete the AE. It is also possible that the continued use of mindfulness in AEs may lead to lower general stress levels in risky adventure situations.

Wright, Sadlo, and Stew (2006) conducted an exploratory study examining the similarities between flow and mindfulness. They had three individuals keep journals and conducted semi-structured interviews with them discussing their experiences of flow. Based on their findings they discuss the similarities of challenge/skills states and

mindfulness as being living in the present, lack of worry, and engaging in intrinsically rewarding activities. They were different in regards to the amount of effort required, the perception of time passing, and the consequences. They suggest that the challenge/skills experience may activate the sympathetic nervous system, while the mindfulness experience may activate the parasympathetic nervous system. As their study was exploratory, Wright, Sadlo, and Stew recommend further research examining these two psychological processes, how they might work together, and what other processes might be involved in these experiences (2006).

Based on this research, mindfulness will be assessed in the present study to evaluate the relationship between mindfulness and flow state groups. In the present study, mindfulness will be examined as a cognitive skill that may or may not be used during AEs. Mindfulness is expected to be closely related to the state of flow, but the relationship between mindfulness and the other flow state groups (Boredom, Control, Arousal, and Anxiety) has yet to be explored. The current study proposes to evaluate these relationships and their subsequent effect on psychological outcomes.

Emotion Regulation

Emotion regulation has been used in many different types of therapies and is similar to the self-regulation of emotional responses discussed above. Gratz and Roemer (2004) discuss emotion regulation as “an awareness, understanding, and acceptance of emotions, and the ability to act in desired ways regardless of emotional state” (p. 41). The awareness and acceptance of emotional responses is similar to the attention and attitude mechanisms of mindfulness. The ability to perform behaviors regardless of emotional state also seems to coincide with the self-regulation aspect of mindfulness

theory. This ability seems paramount in an AE, where the individual perceives the risks as greater than her/his competence.

The understanding of the emotion in emotion regulation theory is the only aspect that does not seem to correspond with mindfulness or flow theory. As fear is a universal and primary emotion, being able to work on understanding, accepting, and evaluating fear is a very important component of AEs. While an individual may gain insight into her/his fear on her/his own simply by participating in AEs, the understanding component can be facilitated through psychoeducation prior to and following the AE. This component is built into the ABC model in their introductions to AEs and debriefings after each AE (Schoel, Prouty, & Radcliffe, 1988).

To combine ideas of emotion regulation, mindfulness, orthogonal flow states, and Adventure Experience Paradigm states into an AE, the adventurous nature and novelty of the AE sets up a situation where most individuals will perceive the risks as greater than her/his competence. This will be likely to induce fear. The AE has clearly defined goals and concrete tasks to meet those goals with clear and reliable feedback. In order to complete the AE, an individual in the Arousal or Anxiety state (corresponding with misadventure and disaster/devastation of the AEP model) will likely need to use mindfulness and emotion regulation skills in order to successfully complete the AE. As s/he becomes more familiar with the AE, s/he will estimate her/his competence as greater than s/he originally had and will not need to use these skills as much in order to be successful. By using mindfulness and emotion regulation skills, s/he will experience positive affect, and may have generalized decline in mood disturbance and stress with continued participation in AEs.

Relationship between effective components of AEs and individual characteristics

The review of the literature has illustrated that individuals may have different subjective experiences while participating in AEs. This variation is due, in part, to the variation in perceptions of challenge and risk, along with estimations of personal skill and competency to meet that challenge. Priest (1992) demonstrated that individuals who tend to have a more timid and fearful personality will perceive the risk as greater, and her/his competency as lesser, than reality. Conversely, Priest found that individuals who tend to be more arrogant or fearless will perceive the risk as lower, and her/his competency as higher, than reality. This indicates that personality characteristics influence how an individual will approach the AE, and her/his subsequent experience while participating.

Additionally, Brown and Ryan (2003) discuss differences in capacities for everyday mindfulness. An individual who has a greater capacity for mindfulness in everyday activities may have a greater ability to regulate her/his reactions, behaviors, and emotions during risky activities, which would allow her/him to be more successful. As a result, the individual may perceive her/his skills as higher in subsequent challenging or risky activities. Capacity for mindfulness may not only directly affect performance during an AE, but it may also affect perceptions of AEs prior to participation.

Similarly, individuals who have greater emotional insight and emotion regulation skills may be able to perform better during an AE. An individual who knows s/he is able to regulate emotions well may perceive the risk to be lower, and their competencies higher, than an individual who does not regulate her/his emotions well. While emotion regulation is thought to be part of mindfulness skills (Linehan, 1994; Bishop et. al., 2004; Brown & Ryan, 2003; Kabat-Zinn, 1990), the relationship between emotion regulation

and mindfulness has not been examined in an AE experience. It is possible that some individuals may be able to complete the AE by adequately regulating their emotions, but would not necessarily be mindful of their experience. Others may be quite mindful of their experience while attempting the AE, but unable to regulate their emotions. Mindfulness in the moment of completing an AE may increase one's ability to regulate emotions induced by the experience.

There are likely many factors related to any given individual's experience while participating in an AE. It is important to understand the key components of these experiences and what makes them positive and rewarding experiences for some, and possibly negative and damaging experiences for others. Four main components that are likely to affect the subjective experience of an individual during an AE are of interest in the current study: Personality characteristics, perceptions of challenge/risk and skills/competence, dispositional mindfulness, and emotion regulation skills. This study aims to examine the relationships between these components and with psychological outcomes.

Hypotheses

The first hypothesis is that individuals who choose to participate in the study will differ on personality characteristics compared to those who choose not to participate. The model of personality adopted for the present study is that of Carver and White (1994), which contains two primary dimensions of personality: behavioral inhibition and behavioral activation. It is hypothesized that those choosing to participate will score higher on behavioral activation and lower on behavioral inhibition than those choosing not to participate. While the researcher poses no other predictions regarding differences

between these groups, exploratory analyses will be conducted on demographic variables as well.

The second hypothesis is that individuals will differ in their perceived risk of the climbing activity, perceived competence in attempting the challenge, perceived level of skills to attempt the challenge, and perceived level of fear associated with attempting the challenge. Individuals will be able to be categorized into the theorized challenge/skills categories of Boredom/Control, Flow, Arousal, and Anxiety. These categories are expected to correspond with the AEP categories, such that individuals in the Anxiety and Arousal groups will be less likely to succeed at the task, while those in the Boredom/Control and Flow groups will succeed in the AE. Success in the task will be measured subjectively by the participant on a 4-point Likert scale after the AE.

The third hypothesis is that the experiences of emotion regulation, mindfulness, and flow during the activity will be related to the individual's challenge/skills category. For the Boredom/Control category, it is hypothesized that individuals will not need emotion regulation skills, as s/he will not have strong emotions induced by the activity. Individuals will not be mindful of the experience, because her/his skills will be more than adequate to complete the activity without being mindful. S/he will have low scores on the flow scale, as the challenge is not great enough to match that of a flow experience. For those in the Flow category, scores will be high on measures of flow, as her/his perceived challenge and perceived skills are both high. Individuals in the Flow group are also expected to score highly on the mindfulness scale, as mindfulness is a component of the flow experience.

The Arousal group is hypothesized to have a significant emotional reaction to the AE. Individuals in this group will either not have the adequate emotion regulation skills to handle and fail to complete the task, or will utilize adequate emotion regulation skills in order to successfully complete the task. If adequate regulation of the emotional reaction is achieved, individuals will experience both flow and mindfulness while completing the task. If adequate regulation of emotions is not achieved, individuals will react similarly to those in the Anxiety group. The Anxiety group will have high levels of fear and inadequate emotion regulation skills to succeed in the task. These individuals will have low flow and mindfulness levels, as the emotional reaction will inhibit these individuals from experiencing these.

The fourth hypothesis is that measures of subjective experience during the AE will be predictive of outcome measure change scores. The measures of subjective experience are measures of flow, emotion regulation, and mindfulness. Higher scores on these scales are expected to be predictive of greater positive change on the outcome variables of self-efficacy, self-concept, and self-esteem.

The fifth hypothesis is that individuals will score differently on the outcome measures of self-concept and self-efficacy based on their challenge/skills group. Here the Boredom/Control group should display little to no change in these measures, as the activity is not challenging enough and would not be expected to provide any psychological change. In the Flow group, individuals will experience increased self-concept and self-efficacy. Individuals in the Arousal group who succeed in the challenge are expected to show increases in self-concept and self-efficacy as well. Individuals in the

Anxiety group and those in the Arousal group who fail to finish the challenge are expected to have no change in or, possibly, decreases in the outcome variables of interest.

This study was aimed at increasing the understanding of different individuals' experiences while participating in challenging activities. It will also assess how these different subjective experiences may affect cognitive and emotional processes as well as psychological well-being. As this is a developing field, this study will inform further research on the psychological effects of these types of experiences and the possibility to use these experiences in an optimal way in treatment settings.

Methods

Measures

Demographic questionnaire

Demographic information was collected regarding age, gender, sexual orientation, ethnicity, and student status (see Appendix A).

Toronto Mindfulness Scale (TMS)

The Toronto Mindfulness Scale (TMS; Bishop et al., 2005) is a 10-item measure, which is intended to be administered immediately following a sitting meditation. Participants are asked to rate items reflecting on their experience on a 5-point Likert scale from 0 (not at all) to 4 (very much). This measure was modified to assess the challenge experience, instead of a sitting meditation, and was administered directly after the challenge experience (see Appendix B).

Difficulties in Emotion Regulation Scale (DERS)

The Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer, 2004) is a measure of emotional arousal modulation. It also measures awareness, understanding,

and acceptance of emotional states. Most importantly, this scale measures the ability to behave in desired manners, regardless of one's current emotional state. This measure asks participants to indicate how often 36 statements apply to them on a Likert scale from 1 (almost never) to 5 (almost always). The measure consists of 6 subscales: Non-acceptance of Emotional Responses (Non-accept), Difficulties Engaging in Goal-Directed Behavior (Goals), Impulse Control Difficulties (Impulse), Lack of Emotional Awareness (Awareness), Limited Access to Emotion Regulation (Strategies), and Lack of Emotional Clarity (Clarity). Initial evaluation of the test-retest reliability over a 4 to 8 week period for the measure as a whole was .88, and internal consistency of the subscales ranged from .57 to .89 (Gratz & Roemer, 2004).

The DERS was modified by McLaughlin et al (2007) to assess state levels of emotion regulation, as opposed to the dispositional levels measured in the original version. This state version demonstrated an internal consistency of $\alpha=0.81$. The current study used this version to assess state emotion regulation abilities post-challenge (see Appendix C).

Flow State Scale (FSS)

The Flow State Scale (FSS; Jackson & Marsh, 1996) is a 36-item scale asking participants to rate their level of agreement with statements on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). This measure assesses the experience of flow as a state after a particular experience. The Flow State Scale is made up of nine subscales. The first, Challenge/Skills, indicates a high level of challenge and adequate skills to meet that challenge. The second subscale, Action Awareness, is a measure of whether the participant was able to take the correct actions without having to think about it. The third

subscale, Clear Goals, is a measure of the clarity of the participant's goals for the activity. The fourth, Unambiguous, is a measure of the lack of clarity in the purpose of the activity and in the feedback during the activity. The fifth, Concentration, is a measure of the participant's ability to concentrate fully on the activity without distraction. The sixth subscale, Paradox (Control), is a measure of how much control the participant felt they had over the situation and his/her body. The seventh, Self-consciousness, is a measure of how much the participant was concerned about how others perceived him/her. The eighth subscale, Transformation (of Time), is a measure of whether the participant felt that time was altered by either appearing slower or faster than normal. The ninth subscale, Autotelic, is a measure of whether the participant felt the experience was intrinsically rewarding (See Appendix D).

Behavioral Inhibition Scale/ Behavioral Activation Scale

The Behavioral Inhibition Scale and Behavioral Activation Scale (BIS/BAS; Carver & White, 1994) is a 24-item questionnaire using a 4-point Likert scale, which measures the motivation driving individuals' behaviors. This scale comprises two main subscales of motivation: Behavioral Inhibition (BIS) and Behavioral Activation (BAS). Carver and White (1994) theorize that the BIS is an avoidance system to regulate aversive motives to move away from something unpleasant. In contrast, the BAS is an approach system to motivate an individual toward a desired goal. The BAS has 13 items and has been shown to have a Cronbach's *alpha* of .73. The BIS is comprised of 7 items and has been shown to have a Cronbach's *alpha* of .74 (Carver & White, 1994; see Appendix E).

Experience Evaluation Questionnaire (Pre, Post, Follow-up)

The researcher created this questionnaire in three different versions for pre-challenge, post-challenge, and follow-up assessments. For the Pre and Post challenge versions, it contains Likert scale questions rating perceived and actual assessments of the challenge of the climb, the participants' skills and competence to complete the challenge, and perceived level of risk regarding attempting the challenge. The Post version also includes a subjective rating (4-point Likert scale) of success in the AE. In the Follow-up version, participants are asked to rate their agreement with statements regarding their enjoyment of the experience and likelihood that they would participate in similar activities in the future. They are also asked open-ended questions about the experience. The participants are asked about any subsequent participation in similar activities and open-ended questions about how the experience has affected them (see Appendix F).

Tennessee Self Concept Scale: Second edition

The Tennessee Self Concept Scale (TSCS:2; Fitts 1971) is a 100-item measure of how an individual portrays what s/he does, likes, and feels. The scale summarizes an individual's self-image in terms of his/her sense of self-worth, and whether that self-image is realistic or deviant. The five main external facets of self-concept that the TSCS:2 measures are: moral-ethical, social, personal, physical, and family. The TSCS:2 also measures three main internal facets: identity, behavior, and self-satisfaction. The scores are based on a normative sample of 3,000 people from 7 to 90 years of age. For this study, the 20-item screening version was used (see Appendix G).

Regulatory Emotional Self-efficacy Scale

The Regulatory Emotional Self-efficacy Scale (RESE; Caprara & Gerbino, 2001) is a 32-item self-report measure of perceived ability to regulate negative emotions and express positive affect (Caprara, Di Giunta, & Eisenberg, 2008). Participants report level of confidence on a 4-point Likert scale from “not at all confident” to “quite confident.” This measure has been shown to be reliable and valid in multiple cultures (Caprara, Di Giunta, & Eisenberg; see Appendix H).

Participants

Participants were recruited from the University of Montana (UM) introductory psychology subject pool over three consecutive semesters. The available population contained approximately 300 students each semester who were enrolled in an introductory psychology course. A power analysis based on an ANOVA with three levels and an estimated medium effect size of 0.25 indicated that a sample size of 180 was needed for power of 0.88. Subjects were required to be eighteen years of age or older to participate. The incentive for participation was course credit. Out of 1110 participants who were screened for the study, 828 agreed to participate in the climbing experience and 282 declined. For the total screened sample, ages ranged from 18 to 55, with a mean age of 20.35 (SD = 4.164). Screened participants identified as 55.6% female, 44% male, and 0.1% transgender. With regard to sexual orientation, 94.6% identified as heterosexual, 1.6% as homosexual, 2.6% as bisexual, and 0.5% as “other.” With regard to ethnicity, the sample was largely Caucasian (88.7%), followed by 3.4% American Indian/Native American, 3.2% Multicultural, 1.3% Latino/Latina or Hispanic, 0.9% Asian American/Pacific Islander/Filipino, 0.4% African American, and 1.3% Other. The total

sample consisted of 65% Freshmen, 21.9% Sophomores, 8.4% Juniors, 3% Seniors, and 0.6% Graduate Students.

Out of the 828 participants who were willing to participate in the AE, 169 completed the study. Their ages ranged from 18-45, with a mean age of 20.23 (SD = 3.90). In terms of gender, 46.7% were male and 53.3 % were female. In regards to sexual orientation, 97% identified as heterosexual, 1.8% as homosexual, and 1.2% as bisexual. The sample remained largely Caucasian (90.4%) with 2.4% identifying as American Indian/Native American, 2.4% Multicultural, 1.8% Latino/Latina or Hispanic, 1.2% Asian American/Pacific Islander/Filipino, 0.6% African American, and 1.2% Other. The sample of those who participated in the AE consisted of 65.7% Freshmen, 24.1% Sophomores, 5.4% Juniors, 3.6% Seniors, and 1.2% Graduate Students.

Out of the 169 participants who completed the AE, 129 participants completed the follow-up questionnaires. This subgroup was highly representative of the total sample of those who completed the AE, with no statistically significant differences on demographic variables.

Procedure

Participants were recruited through their instructors and proctors in their introductory psychology classes. The University of Montana psychology department holds a screening day when introductory psychology students are able to participate in screenings for research studies in return for course credit. On screening day, students were given a personality assessment (BIS/BAS) and information about further participation in the study. This information included a very brief description of the activities they would be asked to perform and contact information for the researcher. If

participants were interested in continuing their participation, they provided contact information for the researcher to contact them regarding further participation. This allowed individuals to self-select into the study. The researcher was then able to evaluate differences in personality characteristics from the screening measure between those who self-selected into the study and those who did not participate further.

Once the participants volunteered to participate in the adventure experience, they were contacted by the researcher to schedule a time to complete their AE. At the University of Montana Fitness and Recreation Center indoor climbing wall, they were fitted with a harness and given a description of the climbing task (See Appendix J). After being fully informed on the extent of their participation, they were asked to sign a research consent form and the University of Montana climbing liability waiver (Appendix K). Participants were then asked to evaluate the perceived challenge and risk of the activity, their perceived abilities to complete this challenge, and their perceived amount of fear in attempting the challenge in the Experience Evaluation Questionnaire (EEQ). They also filled out self-concept (TSCS), and self-efficacy (RESE) questionnaires.

Participants then attempted the challenge, which was a beginner level rock climb. This route was set by the climbing wall staff and verified by the researcher to be a 5.6 rated climb using the Yosemite Decimal System, which ranges from 5.0 to 5.15 (Cox & Fulsaa, 2003). Participants were provided with basic instruction in safety and climbing technique from a designated Outdoor Program employee who had adequate training. Each participant attempted the challenge individually to limit the social component of attempting the challenge as much as possible. Participants attempted the rock climb with

an Outdoor Program employee as their belay partner to ensure the safety of the participant. This meant that the Outdoor Program employee controlled the rope, which the participant was tied to, and was able to catch or hold the participant in the event that s/he fell from the holds on the artificial climbing wall. While the participant was attempting the climb, s/he was given technical advice and encouragement to give her/his best effort.

When the participant either completed the activity or decided to discontinue without reaching the top of the climb, s/he was given post measures. Participants were asked to evaluate the actual challenge and risk of the activity, their actual abilities to complete this challenge, and their actual amount of fear in attempting the challenge in the EEQ questionnaire. They were also asked to fill out the self-concept (TSCS) and self-efficacy (RESE) questionnaires, a questionnaire assessing their Flow state during the challenge (FSS), an emotion regulation assessment adjusted to pertain directly to the challenge experience (DERS), and a state mindfulness questionnaire (TMS). All participants were given contact information for the researchers and referral information for the University of Montana Counseling and Psychological Services Center (CAPS) to minimize any harmful effects of participating in the study. If participants needed immediate assistance, services were available and provided by the researchers (Abby Kiklevich, M.A. or Bryan Cochran, Ph.D.) or the participant was to be escorted to CAPS. However, no participants required the use of any psychological services at any point during the study. The researchers also filled out a measure assessing the degree of encouragement given to the participant by the belayer during the AE, on a 5-point Likert scale (See Appendix I).

Two weeks after completing the challenge experience, participants were emailed a link to a follow-up set of questionnaires. Participants completed these questionnaires on a secure server from a location of their choosing. This follow-up included the EEQ (follow-up) with qualitative questions about participating in the experience, the self-concept scale (TSCS), and a self-esteem questionnaire (RSE). Participants were given a more complete debriefing after the follow-up questionnaire including a description of the research project objectives, researcher contact information, and referral information for psychological services.

The study proposal and procedures were reviewed and approved by the Internal Review Board at the University of Montana.

Results

Demographics

Analyses were conducted to determine if there were any differences on demographic variables between individuals who self-selected into the study and those who did not. The only statistically significant difference in the two samples was noticed in the distribution of gender, $\chi^2(1, 1110)=21.86, p <.0001$. There was a greater proportion of males in the sample who chose to participate (48.2%) than those who declined further participation (32.3%). Also, with regard to ethnicity, the sample willing to participate further contained five individuals identifying as African American, where the sample declining further participation included no individuals identifying as such (See Table 2.1).

Results for Hypothesis #1: Are there Differences on Personality Variables Between those who Self-Selected to Participate and those who Declined?

Two *t*-tests were used to assess differences on the two personality scales (BIS/BAS) between individuals who self-selected to participate and those who did not. As hypothesized, individuals who agreed to participate further scored higher on Behavioral Activation ($M = 41.87$, $SD = 4.684$) than those who declined further participation ($M = 40.12$, $SD = 5.341$), $t(983) = 4.564$, $p < .001$, Cohen's $d = 0.25$ (See Figure 2.1). For Behavioral Inhibition, those who agreed to participate further scored lower ($M = 19.47$, $SD = 3.591$) than those who declined further participation ($M = 20.63$, $SD = 4.074$), $t(1012) = 3.976$, $p < .001$, Cohen's $d = 0.29$ (See Figure 2.2).

A One-way ANOVA was performed to assess differences on the BIS and BAS scales between the four flow state groups discussed below. No statistically significant differences were observed (See Figures 2.3 and 2.4).

Results for Hypothesis #2: Are there Differences in Perceived Ratings of Challenge, Skills, Competence, and Risk, such that Flow-State Groups can be Created?

Participants were asked to rate their perceptions of how challenging the climb would be, their skill level at completing the climb, their competence at the task, and the level of risk involved in participation both prior to and after their attempt at climbing the wall. The reliability of the perceived pre-climb challenge, skill level, competence, and level of risk was assessed using the correlation of these measures with their respective post-climb assessments. All the correlations were statistically significant in strength at a $p < .001$ level and were as follows: challenge, $r = -.350$; skill level, $r = .423$; competence, $r = .492$; and level of risk, $r = .413$. Though they were significantly correlated, there were statistically significant differences in the pre-climb perceptions and post-climb assessments of expected challenge [$t(165) = 8.225$, $p < .001$], skill level [$t(165) = -$

6.358, $p < .001$], and competence [$t(164) = -5.052, p < .001$]. Interestingly, the participants rated the climb in post-climb assessments as less challenging, their own skill levels as greater, and their competence as greater than in their pre-climb perceptions. The level of risk was not significantly different between pre- and post-climb assessments, and most of the participants rated the level of risk as low on both occasions (See Table 1.2).

Based on pre-challenge perceptions of the level of challenge the climb presented and level of skills the individual possessed to meet that challenge, individuals were separated into flow state groups (Boredom/Control, Flow, Arousal, and Anxiety). This was accomplished by dichotomizing the Likert scale ratings for the perceived challenge into High and Low groupings, where those who rated the challenge as “low” remained in the Low rating group, and those who rated the challenge as “medium” or “high” were collapsed into the High rating group. The perceived skills ratings remained in groups of Low, Moderate, and High (See Table 1.4). Demographic variables were assessed to examine possible differences between the flow-state groups. No statistically significant differences were found (See Table 1.1).

Boredom/Control Group

The Boredom/Control group rated the perceived challenge as Low and their skills as either High, Moderate, or Low ($n = 40$). The mean age for this group was 19.78 (2.8), the group was 42.5% female, and comprised primarily of individuals of Caucasian ethnicity (95%) followed by American Indian/Native American (2.5%) and Multicultural (2.5%). In terms of class standing, the group was 52.5% Freshman, 27.5% Sophomore, 15% Junior, 2.5% Senior, and 2.5% Graduate Student. The average height was 5.39 feet (0.44) (See Table 1.1).

Prior to attempting the climbing challenge, participants in this group all expected the climb to present a Low level of challenge, as defined by the group membership. When rating his/her level of skill in meeting that challenge, one individual rated his/her skill as Low, 28 rated their skill level as Moderate, and 11 rated their skills as High. When asked their level of competence in completing the climb, none of the participants in this group rated their competence as Low, 15 rated it as Moderate, and 25 rated their competence as High. In terms of the perceived level of risk associated with participating in the challenge, 35 individuals rated the risk as Low, five rated it as Moderate, and no one rated the risk as High. On a scale rating their level of fear associated with attempting the climb from 0 (no fear) to 6 (worst fear ever), the average rating for this group was 0.96 (.93). Participants subjectively rated their level of success after completing the climb on a scale from 1 (Completely Failed) to 5 (Completely Succeeded). One participant in this group rated his/her success as “Mostly Succeeded,” and the other 39 individuals in the group rated their success as “Completely Succeeded.” Everyone in this group completed the climb by making it all the way to the top, without any encouragement from the belayer (See Tables 1.2 and 1.3).

Flow Group

The Flow group rated the perceived challenge as High or medium and their skills as High ($n = 13$). The mean age for this group was 21.46 (3.6), the group was 38.5% female, and composed primarily of individuals of Caucasian ethnicity (84.6%) followed by Asian American (7.7%) and Multicultural (7.7%). In terms of class standing, the group was 46.2% Freshman, 38.5% Sophomore, 7.7% Junior, and 7.7% Graduate Student. The average height was 5.43 feet (0.48) (See Table 1.1).

Prior to attempting the climbing challenge, 11 participants in this group all expected the climb to present a Moderate level of challenge and two participants expected a High level of challenge. When rating their level of skill in meeting that challenge, all 13 participants rated their skills as High, as defined by group membership criteria. When asked their level of competence in completing the climb, none of the participants in this group rated their competence as Low, nine rated it as Moderate, and 4 rated their competence as High. In terms of the perceived level of risk associated with participating in the challenge, six individuals rated the risk as Low and seven participants rated the risk as High. On a scale rating their level of fear associated with attempting the climb from 0 (no fear) to 6 (worst fear ever), the average rating for this group was 1.47 (.96). Participants subjectively rated their level of success after completing the climb on a scale from 1(Completely Failed) to 5(Completely Succeeded). Two participants in this group rated their success as “Mostly Succeeded,” and 10 individuals in the group rated their success as “Completely Succeeded.” Ten individuals in this group completed the climb by making it all the way to the top and two individuals made it to the next highest mark. One participant received “some” encouragement from the belayer, and the rest received none (See Tables 1.2 and 1.3).

Arousal Group

The Arousal group rated the challenge as High or Medium and their skills as Moderate ($n = 74$). The mean age for this group was 19.6 (2.39) and the group was 56.8% female. The Arousal group was comprised primarily of individuals of Caucasian ethnicity (89.2%) followed by American Indian/Native American (4.1%), Multicultural (2.5%), and Latino/Latina Hispanic (2.7). In terms of class standing, the group was 71.6%

Freshman, 21.6% Sophomore, 2.7% Junior, and 2.7% Senior. The average height was 5.26 feet (0.38) (See Table 1.1).

Prior to attempting the climbing challenge, 71 participants in this group expected the climb to present a Moderate level of challenge, and three expected a High level. When rating their level of skill in meeting that challenge, all the participants in this group rated their skill level as Moderate, as defined by group membership criteria. When asked their level of competence in completing the climb, eight of the participants in this group rated their competence as Low, 41 rated it as Moderate, and 24 rated their competence as High. In terms of the perceived level of risk associated with participating in the challenge, 62 individuals rated the risk as Low, 10 rated it as Moderate, and one individual rated the risk as High. On a scale rating their level of fear associated with attempting the climb from 0 (no fear) to 6 (worst fear ever), the average rating for this group was 1.61 (.79). Participants subjectively rated their level of success after completing the climb on a scale from 1 (Completely Failed) to 5 (Completely Succeeded). One participant in this group rated their success as “Completely Failed,” one rated it as “Mostly Failed,” 10 individuals chose “Mostly Succeeded,” and 62 individuals in the group rated their success as “Completely Succeeded.” In this group, 64 participants completed the climb by making it all the way to the top, two made it to the lowest mark, one the next highest, five the third highest mark, and two made it to the fourth highest mark. Three participants required “a lot” of encouragement, two received “considerable” encouragement, seven received “some” encouragement, and 62 participants required no encouragement from their belayer while completing the climb (See Tables 1.2 and 1.3).

Anxiety Group

The Anxiety group rated the challenge as High or Moderate and their skills as Low ($n = 40$). The mean age for this group was 21.46 (6.35) and the group was 60% female. The Anxiety group was comprised primarily of individuals of Caucasian ethnicity (82.5%) followed by Other (5%), Asian American (2.5%), Latino/Latina Hispanic (2.5), and African American (2.5%). In terms of class standing, the group was 70% Freshman, 17.5% Sophomore, and 7.5% Senior. The average height was 5.31 feet (0.4) (See Table 1.1).

Prior to attempting the climbing challenge, 32 participants in this group expected the climb to present a Moderate level of challenge, and eight expected a High level. When rating their level of skill in meeting that challenge, all the participants in this group rated their skill level as Low, as defined by group membership criteria. When asked their level of competence in completing the climb, eight of the participants in this group rated their competence as Low, 27 rated it as Moderate, and five rated their competence as High. In terms of the perceived level of risk associated with participating in the challenge, 32 individuals rated the risk as Low, seven rated it as Moderate, and one individual rated the risk as High. On a scale rating their level of fear associated with attempting the climb from 0 (no fear) to 6 (worst fear ever), the average rating for this group 2.4 (.90). Participants subjectively rated their level of success after completing the climb on a scale from 1 (Completely Failed) to 5 (Completely Succeeded). One participant in this group rated his/her success as “Completely Failed,” two rated it as “Mostly Failed,” nine individuals chose “Mostly Succeeded,” and 28 individuals in the

group rated their success as “Completely Succeeded.” In this group, 26 participants completed the climb by making it all the way to the top, one made it to the lowest mark, four made it to the next highest, five the third highest mark, and four made it to the fourth highest mark. One participant required “a lot” of encouragement, two received “considerable” encouragement, six received “some” encouragement, and 31 participants required no encouragement from their belayer while completing the climb (See Tables 1.2 and 1.3).

Differences between groups on ratings of success in the AE

To assess whether the outcome of the AE (successful, unsuccessful) mapped on to the flow state groups as expected from the Adventure Experience Paradigm, the participants’ subjective ratings of success were used. This rating was dichotomized from a 4-point Likert scale into groups of Successful and Unsuccessful. Only three participants rated their own performance as unsuccessful. One of these individuals was in the Arousal group and two of them were in the Anxiety group.

The participants were also rated for how high they climbed on the wall. This was a five-point rating of marked distances on the climb where 0 was just off the ground, 4 signified reaching the top, and the rest were evenly spaced markers along the climb. When using their objective success in this manner, statistically significant differences were observed, where the Anxiety group did not climb as high as the other groups and significantly lower than the Boredom and Arousal groups, $F(3, 166) = 5.80, p = .001$ (See Table 1.3).

Results for Hypothesis #3: Are there Differences in Subjective Experiences During the AE Based on Flow-State Groupings?

Analysis of variance (ANOVA) was used to assess differences between flow-state groups on the flow, emotion regulation, and mindfulness post-challenge assessments to test hypothesis #3. The only differences observed between the groups were on the Flow State Scale. On the total Flow State Scale, the Anxiety group scored lower than the other three groups, and significantly lower than the Arousal group, $F(3,130) = 2.63, p = .053, \eta^2 = .057$ (See Figure 3.1). On the subscale of Action Awareness, measuring the quality of the individual's attention toward their own physical actions, the Boredom group scored significantly higher than the Anxiety group, $F(3,130) = 3.17, p = .027, \eta^2 = .068$ (See Figure 3.2). On the Unambiguous subscale, both the Boredom and Arousal groups scored significantly higher than the Anxiety group, $F(3,130) = 4.47, p = .005, \eta^2 = .093$ (See Figure 3.3). The Paradox (Control) subscale showed significantly higher scores in both the Boredom and Arousal groups in comparison to the Anxiety group, $F(3,130) = 6.97, p < .001, \eta^2 = .139$ (See Figure 3.4). The Anxiety group had significantly higher scores on the Transformation (of Time) subscale than the Boredom group, $F(3,130) = 2.604, p = .055, \eta^2 = .057$ (See Figure 3.5). Both the Boredom and Arousal groups scored higher on the Clear Goals subscale than the Anxiety group, $F(3,130) = 5.88, p = .001, \eta^2 = .120$ (See Figure 3.6).

When examining differences between flow-state groups on outcome measures of self-efficacy and self-concept, the Flow group scored consistently higher than the other groups on pre, post, and follow-up measures. Statistically significant differences were observed for the pre-climb and post-climb measures of self-concept, $F(3,147) = 4.71, p =$

.004, $Eta\ squared = .088$, and $F(3,152) = 2.82, p = .041, Eta\ squared = .053$, respectively, where the Boredom and Flow groups scored higher than the Arousal and Anxiety groups (See Figures 3.7 & 3.8). ANOVAs were used to examine differences between groups on the change in outcome scores from pre-climb to post-climb and pre-climb to follow-up, with the dependent variables being change scores. No significant differences were observed between the groups.

Results for Hypothesis #4: Does the Participants' Subjective Experience Predict Change in Outcome Measures?

A regression analysis was used to assess the ability of the subjective experience scales to predict change in outcome measures. Here the subjective experience scales are measures of Flow, Emotion Regulation, and Mindfulness. They were regressed onto change scores from pre to post-challenge on the outcome variables of Self-efficacy and Self-concept. The regression model predicting self-concept scores as measured by the TSCS was not statistically significant. For the self-efficacy scores, as measured by the RESE, the overall model was statistically significant, $F(3, 132) = 3.799, p = .012, R^2 = .081$. With all three subjective experience scales in the model, only the Flow State Scale demonstrated significant predictive power, $b^* = .198, p = .03$. This indicates those reporting greater FSS scores also reported greater change in emotional self-efficacy after the climb.

Results for Hypothesis #5: Do Flow-state Groups Predict Psychological Outcomes Post-Challenge?

An ANOVA was used to assess differences between the Flow-state groups on measures of psychological outcomes to test hypothesis #5. Here the outcomes are change

scores on measures of self-concept and self-efficacy. No significant differences were observed between the flow state groups on either scale. Though the differences between groups on the self-concept scores were not statistically significant, overall immediate post-climb scores for both the self-concept and self-efficacy scales were significantly higher than the pre-climb scores, $t(144)=-3.95, p < .001$, Cohen's $d = .146$ and $t(166) = -5.72, p < .001$, Cohen's $d = .262$, respectively (See Figures 4.1 and 4.2).

Follow-up Analysis

Out of the 169 participants in the AE, 129 completed a follow-up survey two weeks after the AE. There were no statistically significant differences in the distribution of participants in the four flow-state groups for this subsample when compared to the total sample of AE completers, $\chi^2(3,296) = 0.107, p = 0.99$. Change in measures of self-concept and self-efficacy, from pre-challenge to the two-week follow-up were assessed overall and by AE group using a paired samples t -test and an ANOVA by group membership on change scores. No statistically significant differences were found in these analyses.

Discussion

It is a growing trend for adolescent treatment providers to use outdoor therapies and adventure experiences as therapeutic tools, despite a relative dearth of research data supporting such interventions. The available research on the participants' subjective experience while participating in these activities is dominated by the idea of flow and challenge/skills ratios, as reviewed earlier. Much of the prevalent research on flow examines the amount of time any given individual experiences flow in her/his daily activities, but there is no research looking at the prevalence of individuals experiencing

flow during a given activity, such as the adventure experiences utilized by adolescent treatment programs.

Participant Characteristics and Adventure Experiences

This study allowed researchers to evaluate the feasibility of conducting adventure experience research with a college student sample. This population was generally willing to participate in research involving an AE, as 75% of individuals who were screened volunteered for further participation. Though there were statistically significant differences in the personality variables of behavioral inhibition and behavioral activation in the expected directions between those willing to participate and those who were not, the differences were likely clinically insignificant. The mean difference on the BIS scale was one point on a scale ranging from 7 to 28. The mean difference on the BAS scale was two points on a scale ranging from 13 to 52. The only other observed difference between those who self-selected for participation and those who declined was a greater proportion of males self-selecting for participation. This may have been due to greater interest in males to participate in such an activity, or it may have been a product of the available research options for males at those times. During at least one of the semesters of data collection, the AE study was one of only two psychology department studies at the University of Montana accepting males as participants.

Perceptions of the AE and Flow-State Groups

In terms of how participants perceived the AE prior to participation, the majority of the participants rated the challenge as moderate, and 44% of the participants' ratings placed them in the Arousal flow-state group. The smallest group was the Flow group, consisting of only 7.8% of the sample. Participants were expected to initially view the

activity as challenging and their skills as low or moderate. Just as individuals gain skills and competence when learning any activity, it seems reasonable to assume the Flow group would become larger with repeated exposures to the AE. Future studies should examine individuals' progression through the flow-state groups with multiple exposures to the same AE.

It is interesting to note the differences in subjective and objective success on the climb between the different flow-state groups. The only participants who subjectively rated their attempt at the climb as unsuccessful were those in the Arousal and Anxiety groups. When looking at the objective measure of how far they actually climbed up the wall, the Anxiety group was significantly lower than the other groups. There were individuals who climbed to the top, but who rated their subjective success as low; correspondingly, others felt they were very successful without finishing the climb. This speaks to the importance of knowing each participant's personal goals in a given AE. Future research could examine these subjective ratings and what factors influence an individual's feelings of success or dissatisfaction.

Subjective Experience of the AE

Subjective experiences of the AE were measured with the Flow State Scale, the Toronto Mindfulness Scale, and the Difficulties in Emotion Regulation Scale. The only scale sensitive to differences between flow-state groups was the Flow State Scale. The Toronto Mindfulness Scale may need to be further amended to more directly relate to this activity. Many of the questions on this scale are focused on thoughts, and this particular AE was largely an action-based activity. Though the Difficulties in Emotion Regulation Scale was modified to be present focused instead of assessing general reactions to

emotions, it still did not seem to capture the emotional experience of a participant in the AE. Many of the statements pertained to negative feelings and most, if not all, of the participants were experiencing positive feelings at the end of the AE. Future studies should include a state measure of affect to give pre and post AE.

The Flow State Scale seemed to be the most relevant to this particular experience. Overall, the Anxiety group seemed to have a different experience than the other three groups. Individuals in the Anxiety group felt less aware of their actions and less in control of the situation and their bodies. They reported greater ambiguity in the activity and unclear goals and objectives while climbing. They also scored highest on the subscale measuring the subjective feeling of the transformation of time. This does not support the literature on the flow experience, as one would expect the Flow group to score highest on the transformation of time subscale. The Anxiety group may have scored higher on this subscale simply due to their high emotional arousal during the climb.

These differences in the subjective experience of the groups may be due to the heightened emotional experience of the Anxiety group. With repeated exposures to the AE, the Anxiety group may learn to become more aware of their actions, giving them clearer feedback and making the AE less ambiguous for them. They would be expected to feel a gained sense of control in the situation and increased clarity in their goals for the activity. Future research could use physiological measures during the AE to note differences in physiological responses by group, as well as using repeated exposures to evaluate change over time. It would also be interesting to use emotion regulation skills training and evaluate whether individuals score higher on the Flow State Scale after

emotion regulation training compared to those with an equivalent control-group training on climbing skills.

Psychological Outcomes

While researchers have tried to measure positive psychological effects of participation in adventure activities, there is little research looking at the possible negative effects of such activities. It seems likely that individuals in the Arousal and Anxiety groups, who experience heightened emotions and subsequently fail to complete the activity, may suffer negative psychological effects as a result of their participation in the AE. While one would expect most well-adjusted individuals would not suffer from long-term effects from this experience, it is likely that at-risk youth and adolescents may not be as capable of coping with the inherent stresses of the activity. It is important to examine the possibility of deleterious effects in an at-risk adolescent treatment population, as these effects may be much more prominent in that population.

In this study, there were no significant differences between the groups on the outcome measures of self-efficacy at pre-climb, immediately post-climb, or at follow-up. Differences were observed in self-concept scores at pre-climb and immediately post-climb, where the Flow and Boredom groups scored higher than the Anxiety and Arousal groups. This may be an indication that individuals with greater self-concept tend to perceive their skills as higher than those with low self-concept may, when assessing their ability to complete a challenging activity.

Analyses using the entire sample indicate improvement in self-concept and self-efficacy scores from pre-climb to immediately post-climb. With limited research in this area, it is difficult to assess the importance of the effect sizes of these analyses. In general

terms, the effect sizes for these analyses were “small,” at Cohen’s $d = .146$ and $.262$ for self-concept and self-efficacy respectively. When put into the context of the nature of this study, these effect sizes are quite impressive. These increases in ratings of self-concept and self-efficacy were noticed after one climbing experience, which lasted approximately five to ten minutes. There was no other form of psychological treatment offered such as, processing the experience and how it may have effected one’s self-concept or self-efficacy. These gains were noticed simply after the brief climbing experience alone. This may have been because most participants felt they were successful at the AE, and very few reported any negative outcomes. While these improvements were not maintained at the 2-week follow-up, it is possible these gains may be maintained with repeated exposures to the AE and growth through the flow-states. As individuals build skills and competence to complete the particular AE through repeated trials, they may experience greater improvements in outcome ratings with more long-term effects.

When examining the predictive abilities of subjective ratings on the psychological outcome of self-efficacy, the model including all three subjective experience scales demonstrated significant predictive ability. This indicates an individual’s subjective experience during the climb was related to their change in self-efficacy from pre to post climb. The FSS was a significant positive predictor in this model, such that greater FSS scores were predictive of greater change on self-efficacy scores. Though there were no statistically significant differences between flow-state groups on self-concept or self-efficacy change scores from pre to post climb, the Arousal and Boredom groups had the highest means on the FSS.

Implications

Though much of the research on the effectiveness of AEs utilizes the flow theory, this study found a very small percentage of individuals in the Flow group. Additionally, the Flow group did not show superior gains in self-efficacy and self-concept scores compared to the other three groups. What was interesting was the high numbers of individuals in the Arousal and Anxiety groups, and the overall increases in outcome ratings for the whole sample. It seems it is not the actual experience of flow that is the mechanism of change for most individuals participating in AEs, but rather, the process of building competence and skills in these novel activities. Bandura (1982) described the mastery of progressively more difficult and threatening activities leading to an increased level of perceived self-efficacy, which in turn leads to changes in one's coping behaviors. In this study, individuals tended to rate the challenge as easier and their skills as greater after the climb compared to their ratings before the activity. This suggests some movement toward mastery of the skills necessary for this activity, which the majority of the sample initially rated as at least moderately challenging. In keeping with Bandura's findings, participants in this study reported increased self-efficacy post climb. Results from this study indicate the mechanism of change, which should be further researched, is the relationship between building mastery (physically, mentally, and emotionally) in these activities and gaining self-efficacy.

This study also found results that may inform treatment providers on how to better assist individuals in gaining that mastery in order to move through the flow-state groups from Anxiety to Boredom. Results from the subjective experiences of individuals in the Anxiety group point to several different cognitive skills, which could be used to

help individuals move from anxiety to flow. Treatment providers should focus on helping the individual create clear goals for the AE and on providing clear feedback during the experience. They should assist the individual to gain greater awareness of his/her actions and to feel in control of his/her body. Finally, they could work on grounding the person to time by having them climb slower, using a metronome, or having them reference a timekeeping device during the task.

Treatment providers may also utilize the findings from this study to screen people in order to tailor the experience to their needs. Using the simple ratings of Challenge and Skills prior to the AE, treatment providers would know whether someone would respond to the AE as an individual from the Boredom/Control group, or closer to someone from the Anxiety group. This could inform the need for further training in cognitive and emotion regulation skills for individuals in the Anxiety group to increase the likelihood of success in the AE and beneficial psychological outcomes.

The results of this study have implications for the field of AE research. This was a replication of Jones, Hollenhorst, and Perna's (2003) study combining the orthogonal flow model and the adventure experience paradigm. In this study, the orthogonal flow model was shown to be more effective at creating the flow-state groups than the AEP. Most of the participants rated the risk of the activity as low, making this rating less useful in discriminating groups. It is possible that in a different setting, the rating of risk may prove more useful. Though the mindfulness and emotion regulation measures were not useful in this study, other measures should be explored to increase understanding of the subjective experience of individuals in these different Flow-state groups. Similarly, more sensitive measures of psychological outcomes should be explored in order to better

understand any differences there may be between flow-state groups. Unfortunately, a preferred outcome measure for this field remains to be found.

As this was an exploratory study, the findings also have implications for further areas of study in the research fields of flow, mindfulness, emotion regulation, and outdoor recreation. Many future research directions have already been discussed above. Another idea for future studies is the examination of pre-challenge dispositional mindfulness and emotion regulation to evaluate how these dispositions might affect perceptions of the AE and subsequent psychological outcomes. Additionally, in terms of outdoor recreation research, similar studies should be done using different types of AEs to evaluate strengths and weaknesses of different types of experiences, subsequently selecting those that may minimize harm while maximizing treatment effectiveness.

Limitations

Due to the limited previous research in this area, it was difficult to predict the results, such as the distribution of individuals in each of the flow-state groups. Consequently, this study was exploratory in nature and will need subsequent studies to more fully understand the experiences of individuals during adventure activities, the relationships between their challenge/skills experience and the use of cognitive and emotional skills, and the psychological effects of these different experiences and outcomes.

Another limitation is in the use of a non-clinical, college-aged sample. The results of this study are not generalizable to the actual target population of at-risk adolescents. This sample was used because of the exploratory nature of the study and the possible negative psychological effects of participation. The increased understanding of the

experiences of non-clinical, less vulnerable populations in these activities will allow researchers to make better assessments of risk of participation for the at-risk youth population of interest (Miles, 1993). The findings from this study showed minimal to no adverse effects for participants in terms of psychological outcomes. It seems reasonable to replicate this study with a clinical population using the information learned about the subjective experience of the individuals in the Anxiety group to protect them from any psychological harm.

Future studies should also examine different types of AE experiences and different settings. As this study only utilizes one type of AE in a non-natural setting, these results cannot be generalized to all AEs. Future studies should also compare AEs with control experiences, which do not include the “adventurous” nature. The current study does not evaluate how the subjective experiences during AEs compare to subjective experiences during other challenging, but low risk activities. The current study removed the effect that a natural setting may have by conducting the AE on an artificial climbing wall. Future studies should compare results of individuals participating in artificial environments with results from individuals participating in natural settings.

The use of self-report measures can also be problematic, as social pressures may influence results. There may be ways of collecting physiological responses (heart rate, skin conductance, etc.) that could be used in future studies to verify ratings of fear and emotional stimulation. These measures are difficult to use in the AE setting, but advancements in technology are making these techniques more available.

While there are many limitations involved with conducting exploratory research, the results give rise to many future studies. This study highlighted the need for better

measures of cognitive and emotional experience while attempting the AE, as well as more sensitive measures of psychological outcome. Many of the limitations of this study indicate a lack of generalizability of the results beyond the specific conditions of the study. While it is limited in scope, the limitations allow for future research to examine the generalizability of these models.

Much research is still needed to understand the experiences of different individuals during AEs and the mechanisms of change involved in these activities. Based on the positive outcomes observed in this study from a very brief AE, continued research in this area seems promising in developing these activities into effective treatment options for clinical populations. As more is learned about AEs and the psychological effects of participation, these potentially useful interventions may be tailored to optimize benefit and minimize deleterious effects.

References

- Ball, S. A., Tennen, H., and Kranzler, H. R. (1999). Factor replicability and validity of the temperament and character inventory in substance-dependent patients. *Psychological Assessment, 11*, 514-524.
- Bandura, A. (1982). Self-Efficacy mechanism in human agency. *American Psychologist, 37*, 122-147.
- Basiaux, P., Le Bon, O., Dramaix, M., Massat, I., Souery, D., Mendlewicz, J., Pelc, I., and Verbanck, P. (2001). Temperament and character inventory (TCI) personality profile and sub-typing in alcoholic patients: A controlled study. *Alcohol & Alcoholism, 36*, 584-587.
- Bennett, L. W., Cardone, S., & Jarczyk, J. (1998). Effects of a therapeutic camping program on addiction recovery. *Journal of Substance Abuse Treatment, 15* (5), 469-474.
- Berman, D. S., & Davis-Berman, J. L. (1989). Wilderness therapy: A therapeutic adventure for adolescents. *Journal of Independent Social Work, 3*(3), 65-77.
- Bishop, S., Lau, M., Shapiro, S., Carlson, L., Anderson, N., Carmody, J., et al. (2004). Mindfulness: A Proposed Operational Definition. *Clinical Psychology: Science and Practice, 11* (3), 230-241.
- Brown, K., & Ryan, R. (2003). The Benefits of Being Present: Mindfulness and Its Role in Psychological Well-Being. *Journal of Personality and Social Psychology, 84* (4), 822-848.
- Cason, D., & Gillis, H. L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *Journal of Experiential Education, 17*, 40-47.

- Caprara, G. V., Di Giunta, L., Eisenberg, N., Gerbino, M., Pastorelli, C., & Tramontano, C. (2008). Assessing regulatory emotional self-efficacy in three countries. *Psychological Assessment, 20*(3), 227-237.
- Caprara, G. V., & Gerbino, M. (2001). Affective perceived self-efficacy: The capacity to regulate negative affect and to express positive affect. In G. V. Caprara (Ed.), *Self-efficacy assessment* (pp. 35–50). Trento, Italy: Edizioni Erickson.
- Carver, C. S. & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affect responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.
- Caulkins, M. C. (2006). The role of physical exercise in wilderness therapy for troubled adolescent women. *Journal of Experiential Education, 29*, 18-37.
- Chambless, D., & Ollendick, T. (2001). Empirically Supported Psychological Interventions: Controversies and Evidence. *Annual Review of Psychology, 52*, 685-716.
- Cox, S. M. & Fulsaas, K. (2003). Appendix A: Rating Systems. In S. M. Cox, & K. Fulsaas (Eds.), *Mountaineering: The freedom of the hills* (7th edition ed.). Seattle, WA: The Mountaineers Books.
- Csikszentmihalyi, M. (1975). Play and intrinsic rewards. *Journal of Humanistic Psychology, 15*(3), 41-63.
- Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In Csikszentmihalyi, Mihalyi, Isabella Selega, et al (Eds.), *Optimal Experience: Psychological studies of flow in consciousness* (pp. 15-35). New York, NY: Cambridge University Press.

- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York: Basicbooks, Inc.
- Csikszentmihalyi, M. (2000). The Contribution of Flow to Positive Psychology. *Science of optimism and hope; research essays in honor of Martin E. P. Seligman*, 387-395.
- Csikszentmihalyi, M., & Rathunde, K. (1993). The measurement of flow in everyday life: Toward a theory of emergent motivation. In J. E. Jacobs (Ed.), *Nebraska symposium on motivation, 1992, lincoln, NE, US* (pp. 57-97). Lincoln, NE, US: University of Nebraska Press.
- Eikenaes, I., Gude, T., & Hoffart, A. (2006). Interested wilderness therapy for avoidant personality disorder. *Nord Journal of Psychiatry* (60), 275-281.
- Ewert, A., & Hollenhorst, S. (1989). Testing the adventure model: Empirical support for a model of risk recreation participation. *Journal of Leisure Research*, 21, 124-139.
- Finkenber, M. E., Shows, D., & DiNucci, J. M. (1994). Participation in adventure-based activities and self-concepts of college men and women. *Perceptual and Motor Skills* (78), 1119-1122.
- Fitts, W. H. (1971). The self-concept and self-actualization. *Studies on the Self Concept, Mono 3*, 108.
- Fletcher, T. B., & Hinkle, J. S. (2002). Adventure based counseling: An innovation in counseling. *Journal of Counseling and Development* (80), 277-285.
- Friese, G., Hendee, J. C., & Kinziger, M. (1998). The wilderness experience program industry in the United States: Characteristics and dynamics. *Journal of Experiential Education*, 21(1), 40-45.

- Gass, M. A. (1993). Programming applications of adventure therapy. In M. A. Gass, *Adventure therapy: Therapeutic application of adventure programming* (pp. 83-94). Dubuque, Iowa: Kendall/Junt Publishing Company.
- Glass, J. S. & Myers, J. E. (2001). Combining the old and the new to help adolescents: Individual psychology and adventure-based counseling. *Journal of Mental Health Counseling, 23*, 104-114.
- Gratz, K., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26* (1), 41-54.
- Greene, J. H., & Thompson, D. (1990). Outward Bound USA. In J. C. Miles, & S. Priest, *Adventure Education* (pp. 5-9). State College, PA: Venture Publishing.
- Heard, H. L., & Linehan, M. M. (1994). Dialectical behavior therapy: An integrative approach to the treatment of borderline personality disorder. *Journal of Psychotherapy Integration, 4*(1), 55-82.
- Hill, N. R. (2007). Wilderness therapy as a treatment modality for at-risk youth: A primer for mental health counselors. *Journal of Mental Health Counseling, 29*, 338-349.
- Jackson, S. A. & Marsh H.W. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. *Journal of Sport & Exercise Psychology, 18*(1), 17-35.
- Jones, C., Hollenhorst, S., & Perna, F. (2003). An Empirical Comparison of the Four Channel Flow Model and Adventure Experience Paradigm. *Leisure Sciences, 25*, 17-31.

- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Dell Publishing Group, Inc.
- Kimball, R. (1990). The Santa Fe Mountain Center. In J. C. Miles, & S. Priest, *Adventure Education* (pp. 5-9). State College, PA: Venture Publishing.
- Kjol, R. and Weber, J. (1993). The 4th fire: Adventure-based counseling with juvenile sex offenders. In M. A. Gass, *Adventure therapy: Therapeutic application of adventure programming* (pp. 83-94). Dubuque, Iowa: Kendall/Junt Publishing Company.
- Lazarus, R. S. (1974). *The riddle of man: An introduction to psychology*. Oxford, England: Prentice-Hall.
- Le Bon, O., Basiaux, P., Streel, E., Tecco, J., Hanak, C., Hansenne, M., Anseau, M., Pelc, I., Verbanc, P., and Dupont, S. (2004). Personality profile and drug of choice; a multivariate analysis using Cloninger's TCI on heroin addicts, alcoholics, and a random population group. *Drug and Alcohol Dependence*, 73, 175-182.
- Luoma, J. B., Hayes, S. C., & Walser, R. D. (2007). *Learning ACT: An acceptance and commitment therapy skills-training manual for therapists*. Oakland, CA, US: New Harbinger Publications.
- Maslow, A. H. (1968). *Toward a Psychology of Being*. New York, NY, US: John Wiley & Sons, Inc.
- Mason, M. J. (1987). Wilderness family therapy: Experiential dimensions. *Contemporary Family Therapy* (9), 90-105.

- McLaughlin, K. A., Mennin, D. S., & Farach, F. J. (2007). The contributory role of worry in emotion generation and dysregulation in generalized anxiety disorder. *Behaviour Research and Therapy*, *45*, 1735-1752.
- Miles, J. (1993). Wilderness as healing place. In M. Gass, *Adventure therapy: Therapeutic application of adventure programming* (pp. 43-56). Dubuque, Iowa: Kendall/Hunt Publishing Company.
- Miles, J. & Priest, S. (1990). *Adventure Education*. State College, PA: Venture Publishing, Inc.
- Nadler, R. S. (1993). Therapeutic process of change. In M. Gass, *Adventure therapy: Therapeutic application of adventure programming* (pp. 57-69). Dubuque, Iowa: Kendall/Hunt Publishing Company.
- National Association of Therapeutic Schools and Programs (2008). *Directory of NATSAP Members*. (N. A. Programs, Producer) Retrieved September 30, 2008, from NATSAP Organization Web Site: <http://www.natsap.org/search.asp>
- Neill, J. (2003). Reviewing and benchmarking adventure therapy outcomes: Applications of meta-analysis. *Journal of Experiential Education*, *25* (3), 316-321.
- Parker, M., & Stoltenberg, C. D. (1995). Use of adventure experiences in traditional counseling interventions. *Psychological Reports* (77), 1376-1378.
- Powch, I. G. (1994). Wilderness therapy: What makes it empowering for women? *Theoretical Perspectives*, *15*, 11-27.
- Priest, S. (1992). Factor exploration and confirmation for the dimensions of an adventure experience. *Journal of Leisure Research*, *24*, 127-139.

- Rosenberg, M. (1965). *Society and The Adolescent Self-Image*. Princeton, N.J.: Princeton University Press.
- Russell, K. C. (2003a). A nationwide survey of outdoor behavioral healthcare programs for adolescents with problem behaviors. *Journal of Experiential Education*, 24, 70-79.
- Russell, K. (2003b). An assessment of outcomes in outdoor behavioral healthcare treatment. *Child & Youth Care Forum*, 32 (6), 355-381.
- Russell, K. & Farnum, J. (2004). A concurrent model of the wilderness therapy process. *Journal of Adventure Education & Outdoor Learning*, 4 (1), 39-55.
- Russell, K. C., Hendee, J. C., & Phillips-Miller, D. (1999). How wilderness therapy works: An examination of the wilderness therapy process to treat adolescents with behavioral problems and addictions. In, Cole, D. N. & McCool, S. F. (2000). *Proceedings: Wilderness science in a time of change*. Proc. RMRS-P-000, Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Russell, K. & Phillips-Miller, D. (2002). Perspectives on the Wilderness Therapy Process and Its Relation to Outcome. *Child & Youth Care Forum*, 31 (6), 415-437.
- Schoel, J., Prouty, D., & Radcliffe, P. (1988). *Islands of healing: A guide to adventure based counseling*. Project Adventure, Inc., Hamilton, MA.
- Segal, Z. V., Teasdale, J. D., & Williams, J. M. G. (2004). Mindfulness-based cognitive therapy: Theoretical rationale and empirical status. In S. C. Hayes, V. M. Follette & M. M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. (pp. 45-65). New York, NY, US: Guilford Press.

- Shapiro, S., Astin, J., Carlson, L., & Freedman, B. (2006). Mechanisms of Mindfulness. *Journal of Clinical Psychology*, 62 (3), 373-386.
- Tippet, S. (1993). Therapeutic wilderness programming for borderline adolescents. In M. A. Gass, *Adventure therapy: Therapeutic application of adventure programming* (pp. 83-94). Dubuque, Iowa: Kendall/Junt Publishing Company.
- Wilson, S. J. & Lipsey, M. W. (2000). Wilderness challenge programs for delinquent youth: A meta-analysis of outcome evaluations. *Evaluation and Program Planning*, 23, 1-12.
- Wright, J., Sadlo, G., & Stew, G. (2006). Challenge-Skills and Mindfulness: An Exploration of the Conundrum of Flow Process. *OTJR: Occupation, Participation and Health*, 26 (1), 25-32.
- Ungar, M., Dumond, C., & McDonald, W. (2005). Risk, resilience, and outdoor programmes for at-risk children. *Journal of Social Work*, 5, 319-338.

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Groupings

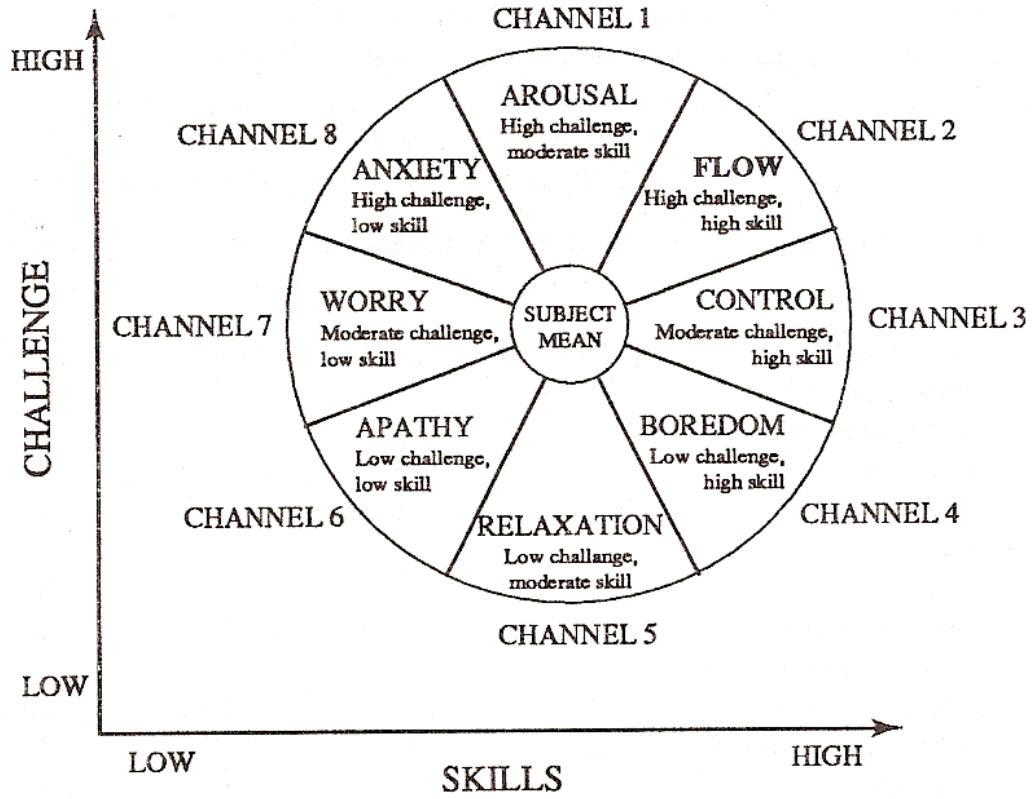
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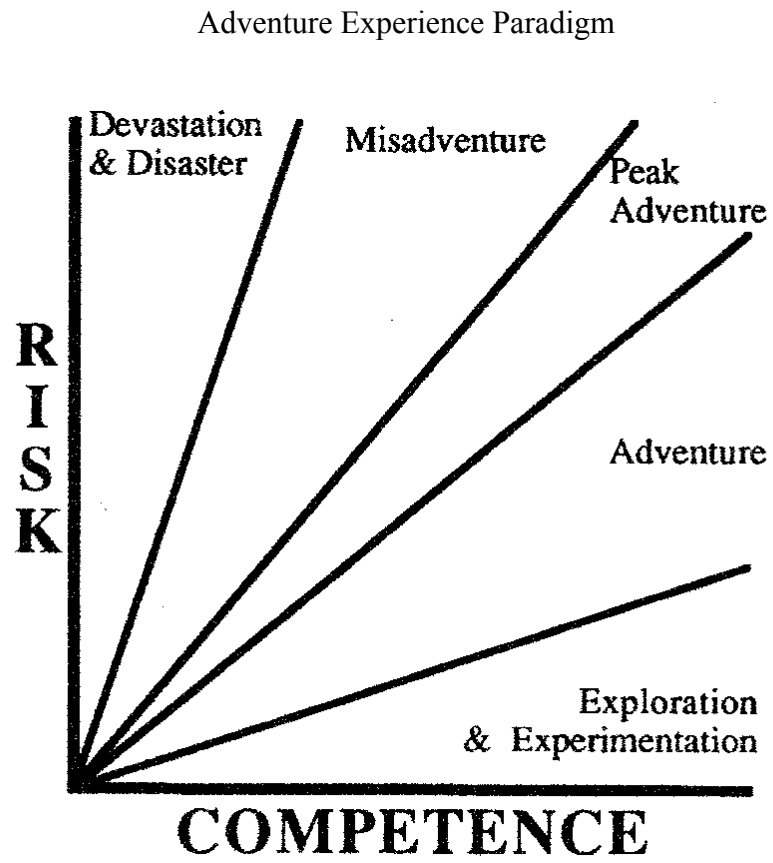
Figure 1.1

Orthogonal Model of Flow



(Csikszentmihalyi and Rathunde, 1993)

Figure 1.2



(Priest, 1992)

Figure 1.3

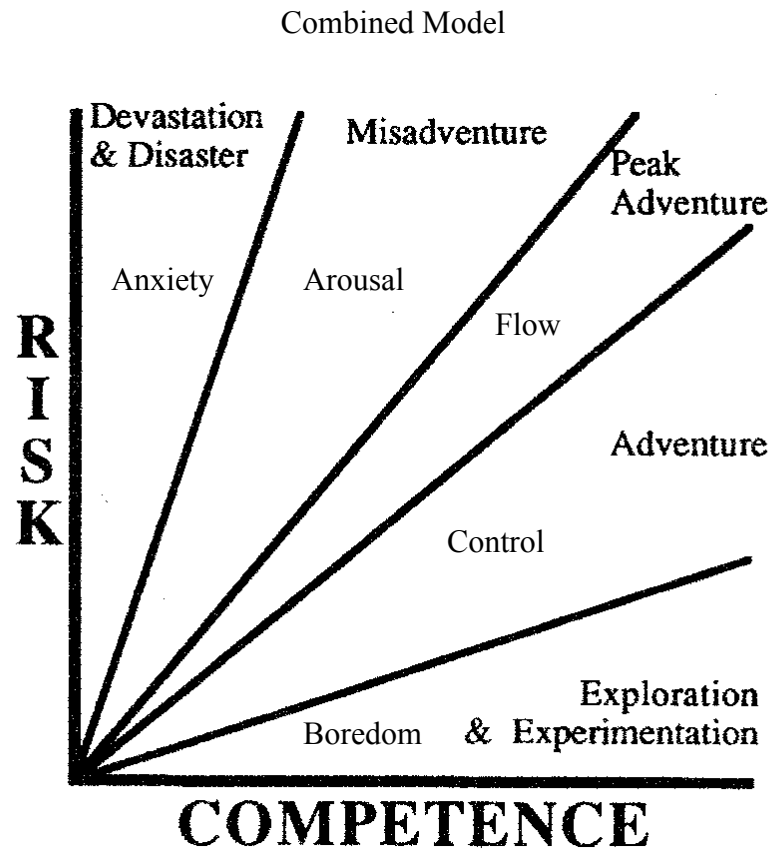


Figure 2 Hypothesis #1: Personality Scales

Figure 2.1

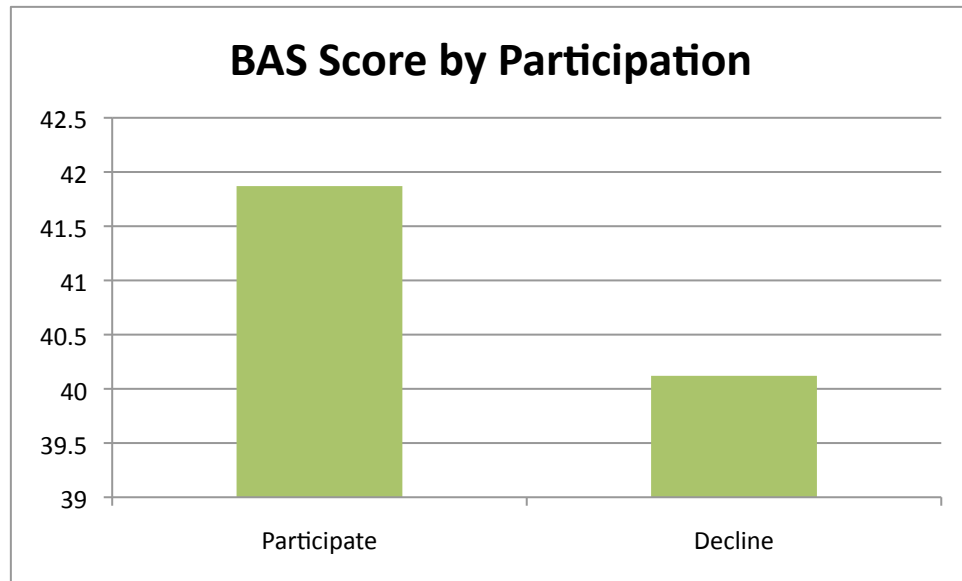


Figure 2.2

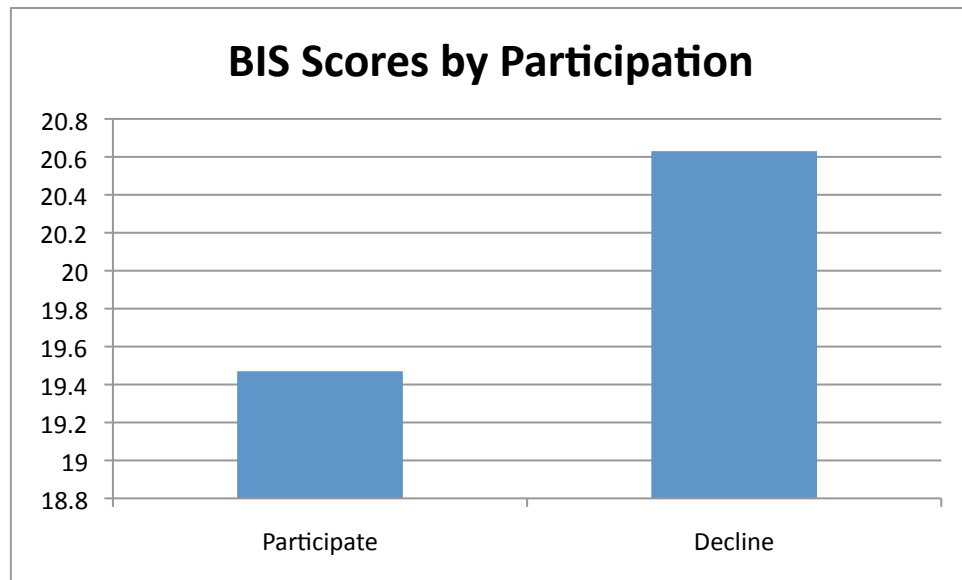


Figure 2.3

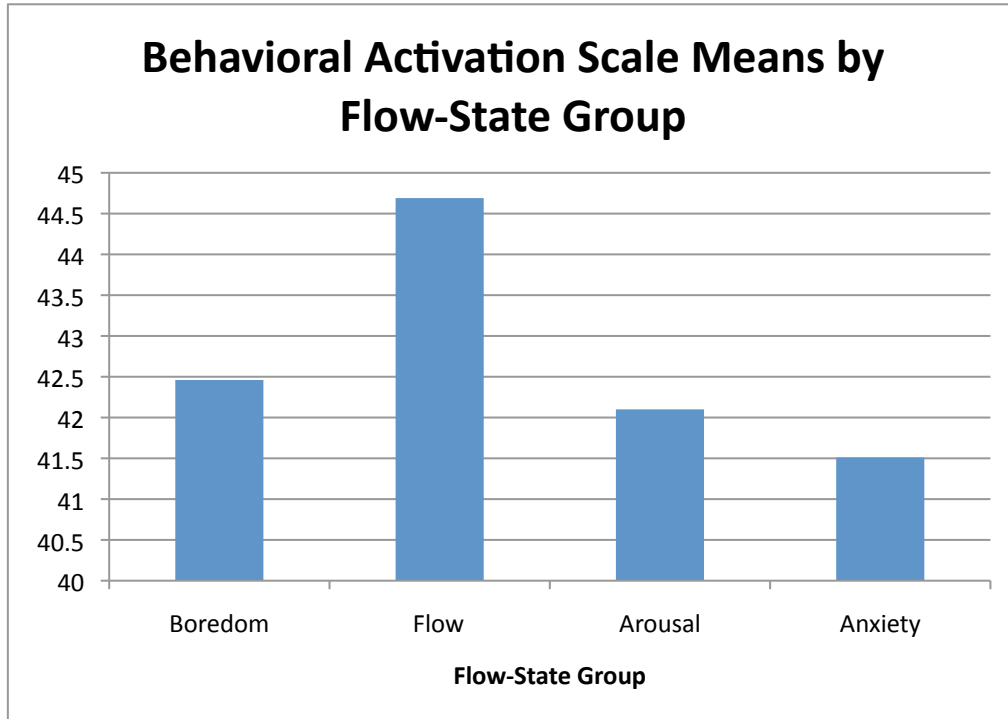


Figure 2.4

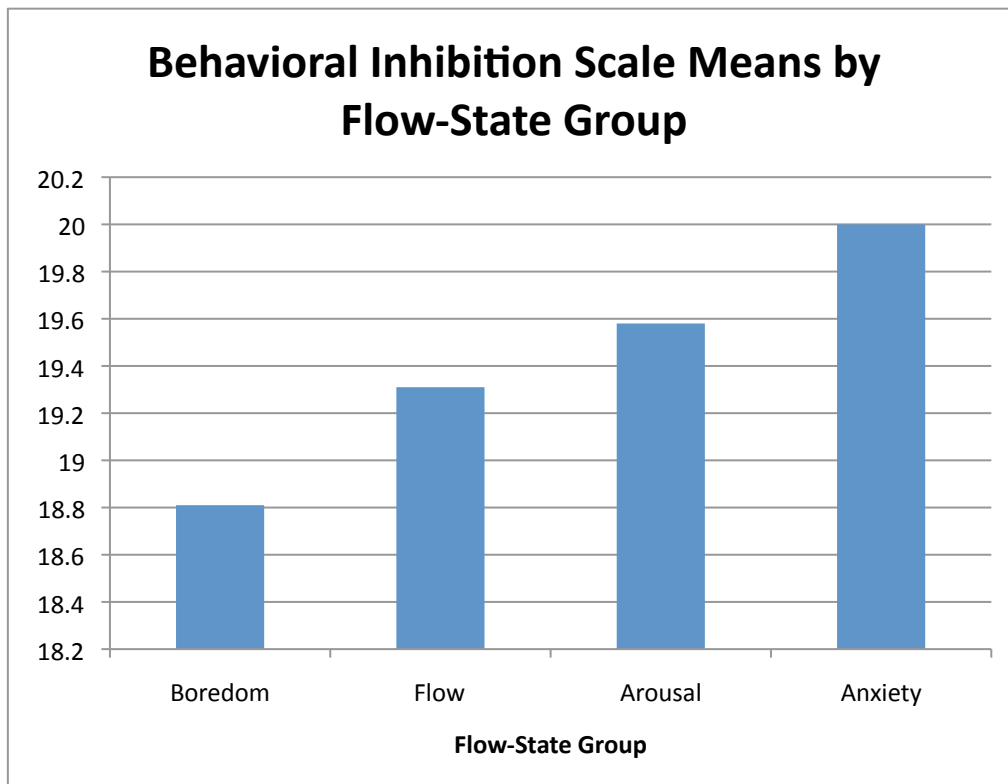


Figure 3 – Hypothesis #3:

Figure 3.1

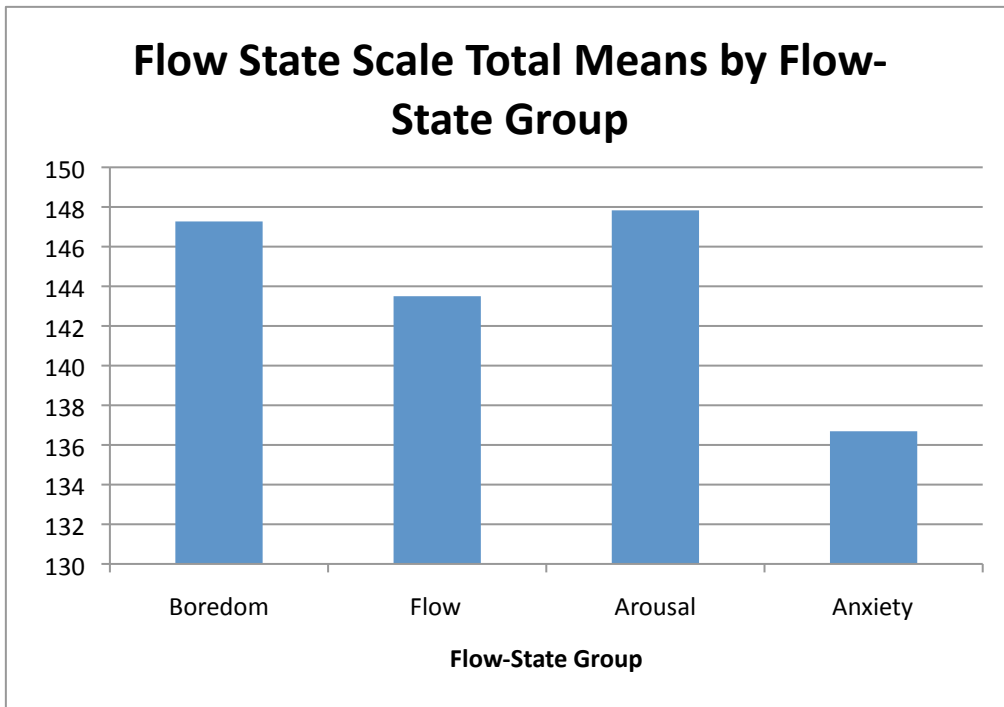


Figure 3.2

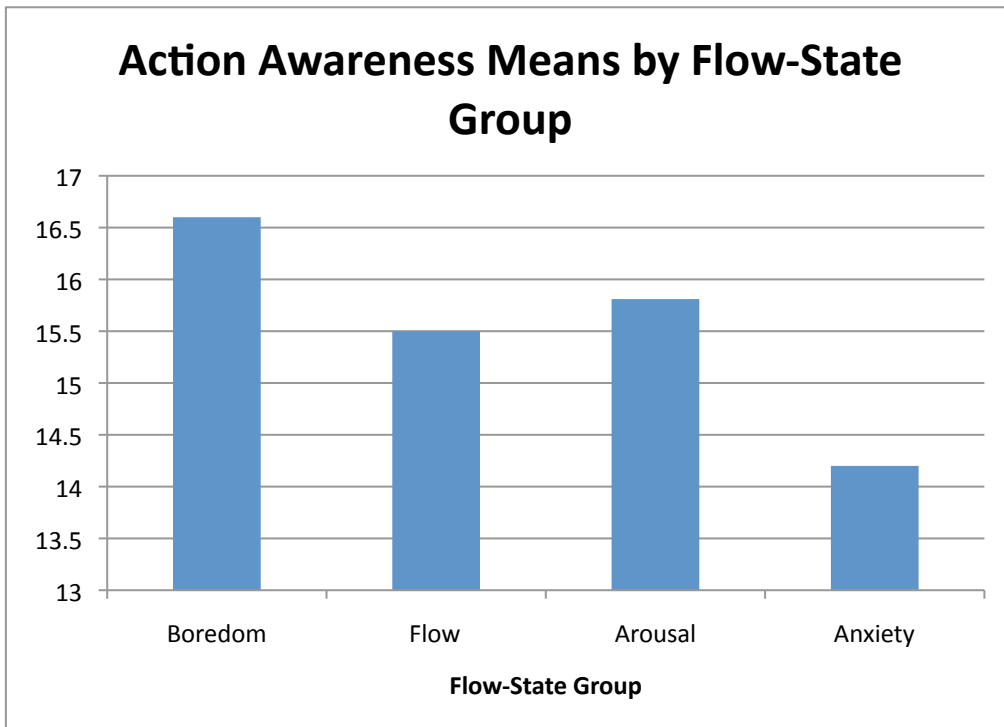


Figure 3.3

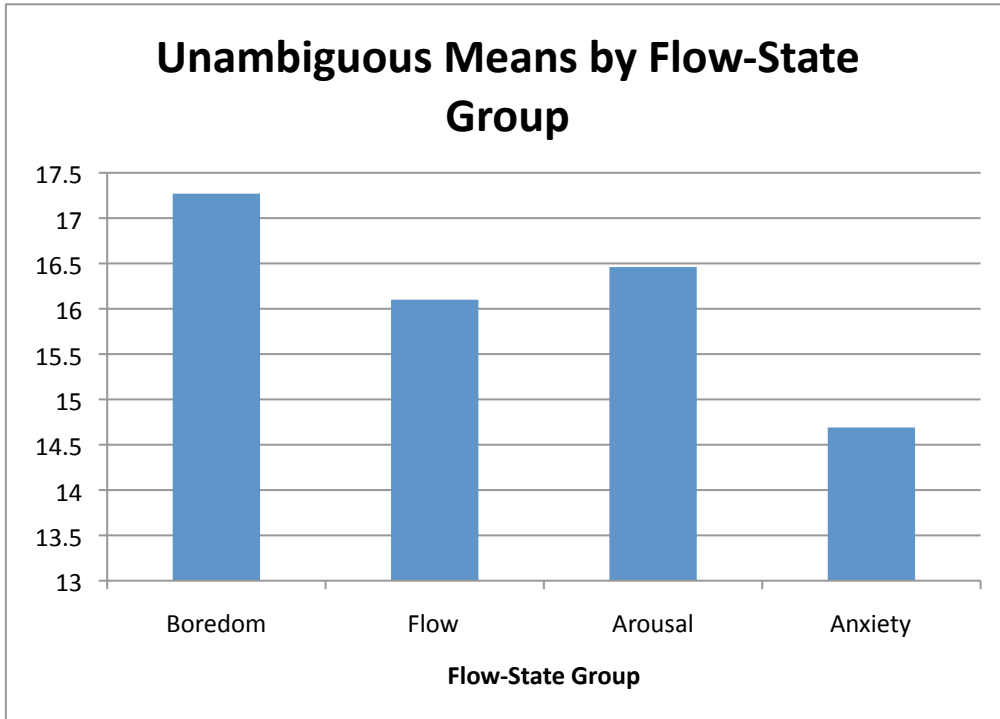


Figure 3.4

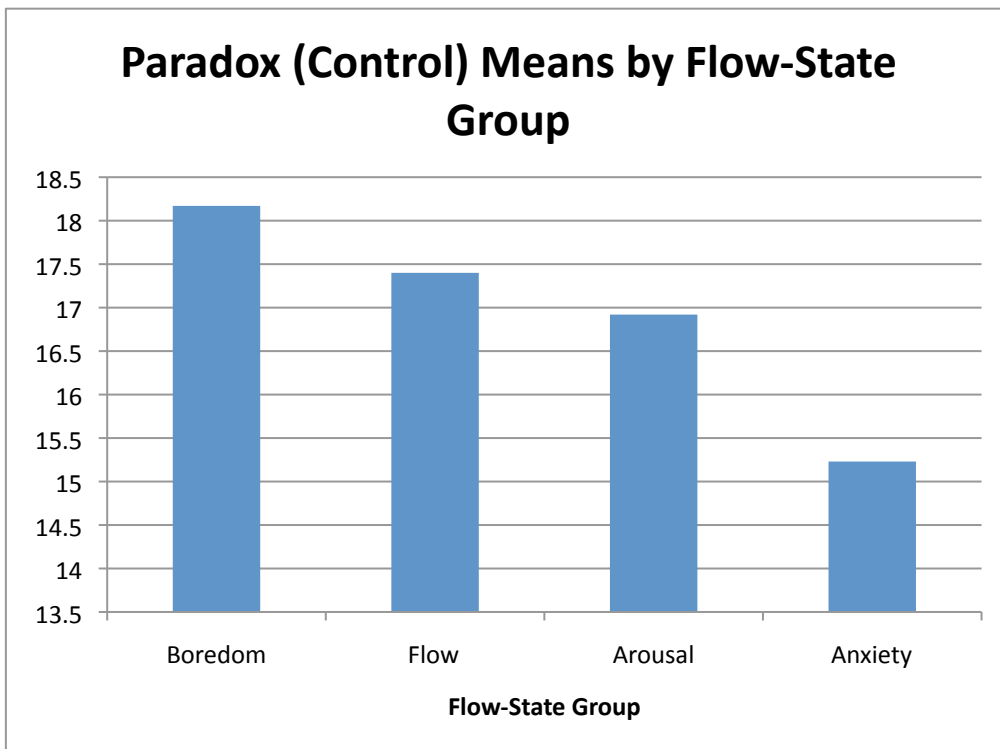


Figure 3.5

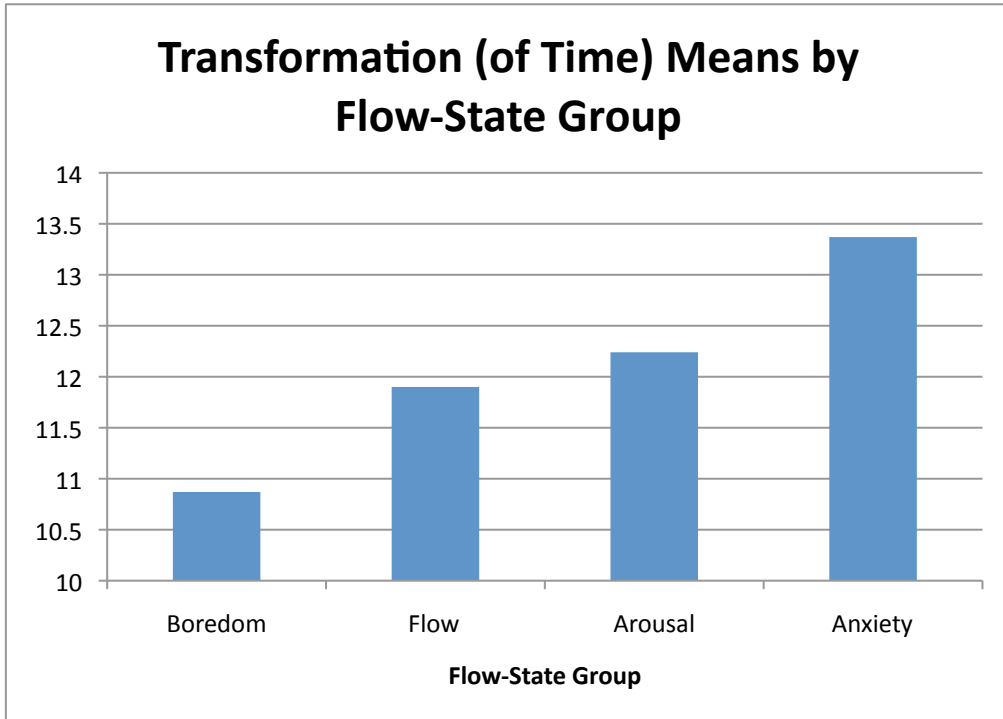


Figure 3.6

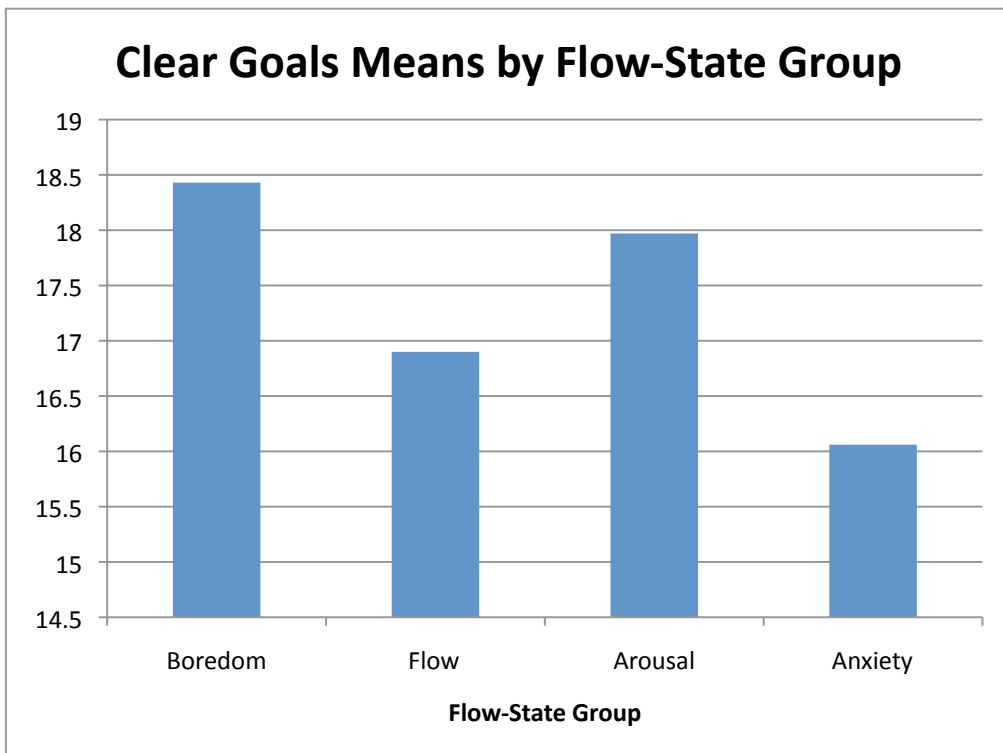


Figure 3.7

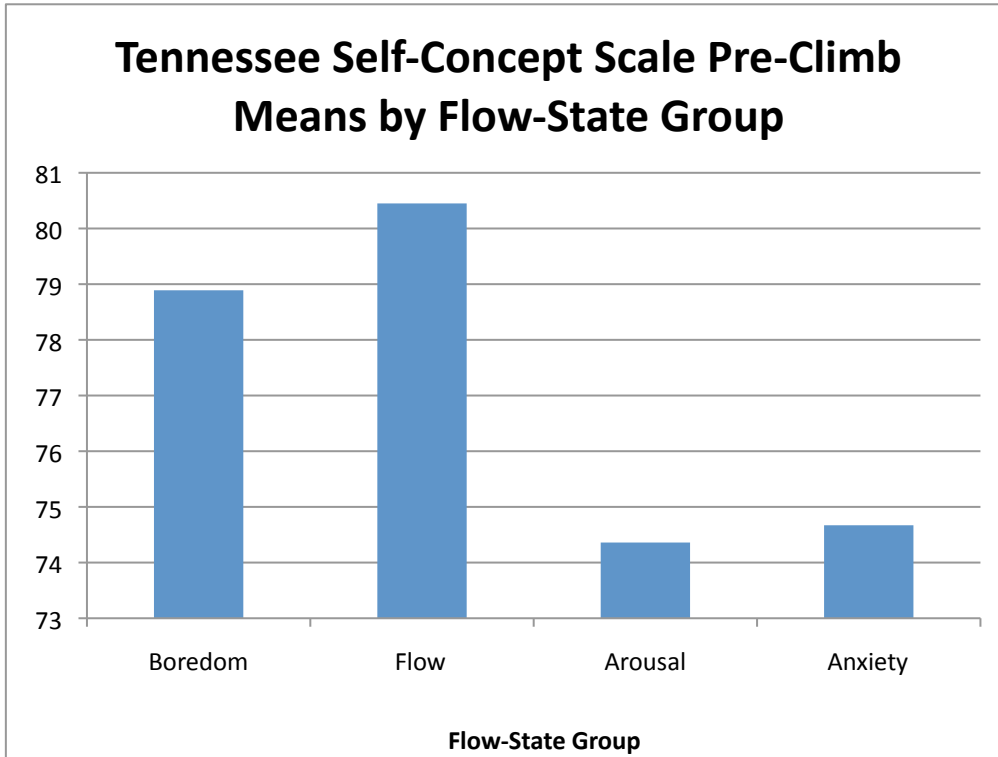


Figure 3.8

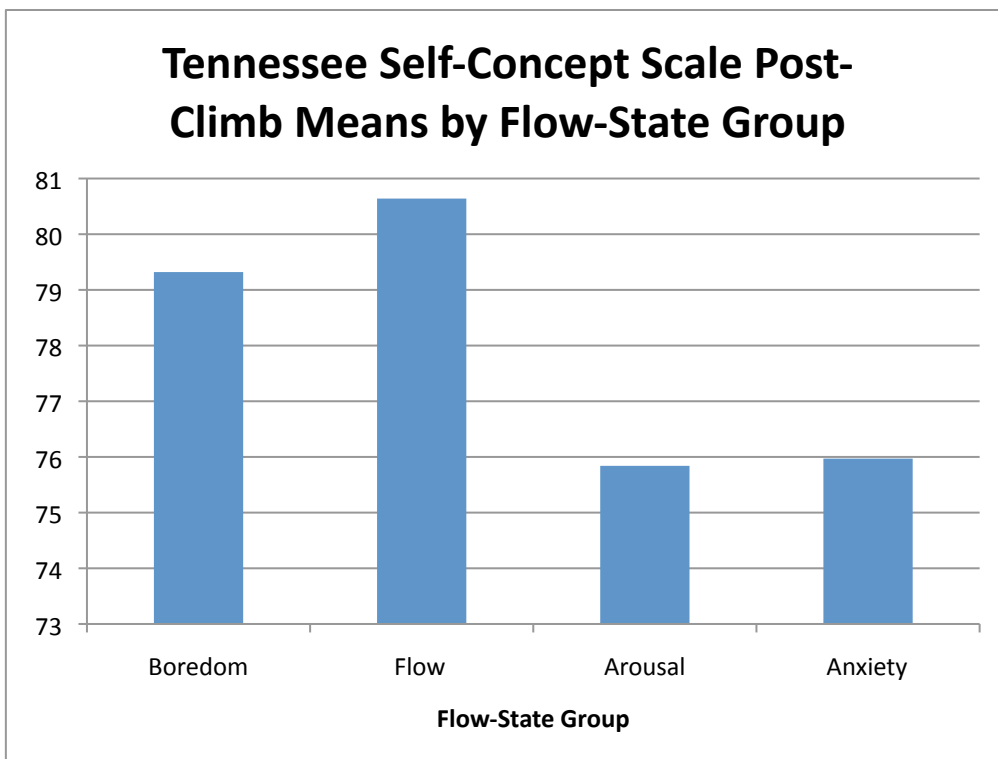


Figure 4 – Hypothesis #5: Psychological Outcomes

Figure 4.1

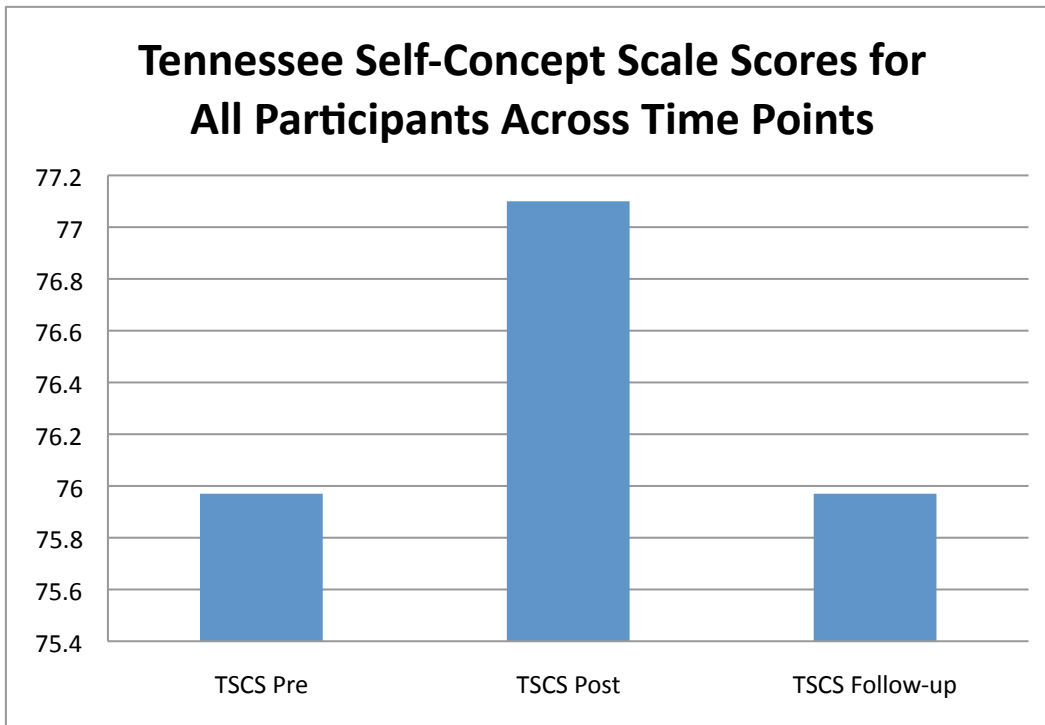
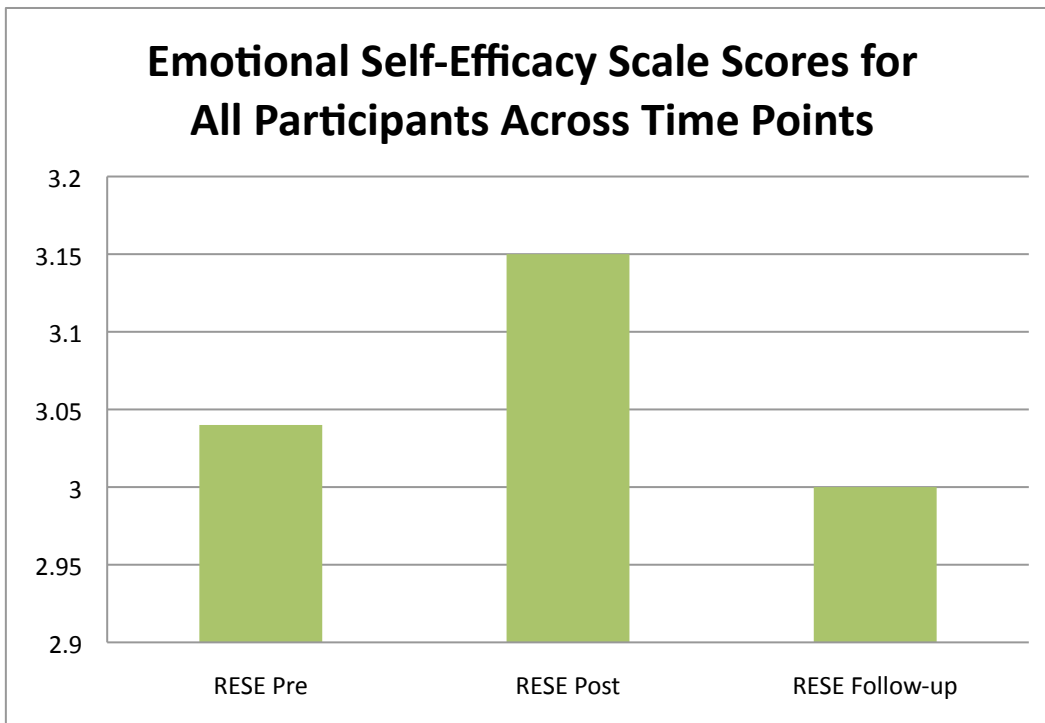


Figure 4.2



Tables

Table 1.1 Demographic Information by Flow-State Group

Table 1.2 Pre and Post Rating Frequencies of AE Perceptions by Flow-State
Group

Table 1.3 Fear and Success Rating Frequencies by Flow-State Group

Table 1.4 Flow State Groups

Table 1.1

Demographic Information by Flow-State Group

(Percentages unless otherwise specified)

	Boredom	Flow	Arousal	Anxiety
N	40 (24%)	13 (7.8%)	74 (44.3%)	40 (24%)
Age [Mean (SD)]	19.78 (2.8)	21.46 (3.6)	19.6 (2.39)	21.46 (6.35)
Female	42.5	38.5	56.8	60
Ethnicity				
American Indian/ Native American	2.5	0	4.1	0
Caucasian/White/Anglo or European American (not Hispanic)	95	84.6	89.2	82.5
Multiracial (parents are from two or more different ethnic groups)	2.5	7.7	2.7	0
Asian American/Pacific Islander/Filipino	0	7.7	0	2.5
Latino/Latina or Hispanic	0	0	2.7	2.5
African American	0	0	0	2.5
Other	0	0	0	5
Class Status				
Freshman	52.5	46.2	71.6	70
Sophomore	27.5	38.5	21.6	17.5
Junior	15	7.7	2.7	0
Senior	2.5		2.7	7.5
Graduate Student	2.5	7.7	0	0

Table 1.2

		Boredom		Flow		Arousal		Anxiety	
N	Time	40 (24%)		13 (7.8%)		74 (44.3%)		40 (24%)	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Challenge									
	Low	40	35	0	6	0	48	0	11
	moderate	0	5	11	6	71	24	32	25
	high	0	0	2	0	3	2	8	4
Skill Level									
	Low	1	2	0	0	0	6	40	13
	moderate	28	17	0	4	74	44	0	21
	high	11	21	13	8	0	24	0	6
Competence									
	Low	0	0	0	0	8	5	8	4
	moderate	15	10	9	2	41	34	27	19
	high	25	30	4	10	24	35	5	17
Level of Risk									
	Low	35	34	6	9	62	63	32	33
	moderate	5	5	7	3	10	10	7	5
	high	0	1	0	0	1	1	1	2

Table 1.3

		Boredom	Flow	Arousal	Anxiety
N		40 (24%)	13 (7.8%)	74 (44.3%)	40 (24%)
Fear [Mean (SD)]		.96 (.93)	1.47 (.96)	1.61 (.79)	2.4 (.90)
Subjective Ratings of Success [Mean (SD)]		3.98 (.16)	3.83 (.39)	3.81 (.54)	3.6 (.71)
	Completely Failed	0	0	1	1
	Mostly Failed	0	0	1	2
	Mostly Succeeded	1	2	10	9
	Completely Succeeded	39	10	61	28
Objective Height of Climb [Mean (SD)]		4 (0)	3.85 (0.38)	3.69 (0.88)	3.25 (1.17)
	1 st Mark	0	0	2	1
	2 nd Mark	0	0	1	4
	3 rd Mark	0	0	5	5
	4 th Mark	0	2	2	4
	Top of Climb	40	11	64	26

Table 1.4

	Challenge/Risk		
Skill/Competence		High	Low
	High	Flow	Boredom/Control
	Moderate	Arousal	
	Low	Anxiety	

Appendices

Appendix A – Demographics

Appendix B – Toronto Mindfulness Scale (TMS)

Appendix C – Difficulties in Emotion Regulation Scale (DERS)

Appendix D - Flow State Scale (FSS)

Appendix E – Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS)

Appendix F - Experience Evaluation Questionnaire (EEQ)

Appendix G – Tennessee Self-concept Scale (TSS)

Appendix H – Regulatory Emotional Self-efficacy Scale (RESE)

Appendix I – Belayer encouragement scale

Appendix J – Description of the Climbing Experience

Appendix K - University of Montana Climbing Wall Liability Waiver

Appendix A

Demographics

Appendix A

Demographic information

1. What is your age? _____
2. What is your gender?
 - Male
 - Female
 - Transgender
 - Other specify _____
3. What is your sexual orientation?
 - Heterosexual
 - Homosexual
 - Bisexual
 - Other specify _____
4. What is your ethnic identification?
 - African American
 - American Indian/ Native American
 - Asian American/Pacific Islander/Filipino
 - Caucasian/White/Anglo or European American (not Hispanic)
 - Latino/Latina or Hispanic
 - Multiracial (parents are from two or more different ethnic groups)
 - Other
5. What is your current class status?
 - Freshman
 - Sophomore
 - Junior
 - Senior
 - Graduate student

Appendix B

Toronto Mindfulness Scale (TMS)

Toronto Mindfulness Scale

Instructions: We are interested in what you just experienced. Below is a list of things that people sometimes experience. Please read each statement. Next to each statement are five choices: “not at all,” “a little,” “moderately,” “quite a bit,” and “very much.” Please indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you just experienced, just now?	Not at all	A little	Moderately	Quite a bit	Very much
1. I experienced myself as separate from my changing thoughts and feelings.	0	1	2	3	4
2. I was more concerned with being open to my experiences than controlling or changing them.	0	1	2	3	4
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings, or sensations.	0	1	2	3	4
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are.	0	1	2	3	4
5. I was curious to see what my mind was up to from moment to moment.	0	1	2	3	4
6. I was curious about each of the thoughts and feelings I was having.	0	1	2	3	4
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.	0	1	2	3	4
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.	0	1	2	3	4
9. I approached the experience by trying to accept it, no matter whether it was pleasant or unpleasant.	0	1	2	3	4
10. I remained curious about the nature of the experience as it arose.	0	1	2	3	4
11. I was aware of my thoughts and feelings without overidentifying with them.	0	1	2	3	4
12. I was curious about my reactions to things.	0	1	2	3	4
13. I was curious about what I might learn about myself by just taking notice of what my attention was drawn to.	0	1	2	3	4

Appendix C

Difficulties in Emotion Regulation Scale (DERS)

DERS-NOW₁

Please read each statement and indicate how much it applies to you **RIGHT NOW**. Fill in a numbered bubble next to each statement according to the following scale: **1** = Not at all; **2** = Somewhat; **3** = Moderately; **4** = Very Much; **5** = Completely.

	Not at all	Some- what	Moderately	Very Much	Completely
1. I am having difficulty making sense of my feelings.	①	②	③	④	⑤
2. I believe that I will continue feeling this way for a long time.	①	②	③	④	⑤
3. I am attentive to my feelings.	①	②	③	④	⑤
4. I feel guilty for feeling this way.	①	②	③	④	⑤
5. I have no idea how I am feeling.	①	②	③	④	⑤
6. I believe that I will end up feeling very depressed.	①	②	③	④	⑤
7. I am acknowledging my emotions.	①	②	③	④	⑤
8. I feel ashamed with myself for feeling this way.	①	②	③	④	⑤
9. I am confused about how I feel.	①	②	③	④	⑤
10. I believe that wallowing in this is all that I can do.	①	②	③	④	⑤
11. I care about what I am feeling.	①	②	③	④	⑤
12. I am angry with myself for feeling this way.	①	②	③	④	⑤
13. I know exactly how I am feeling.	①	②	③	④	⑤
14. It will take me a long time to feel better.	①	②	③	④	⑤
15. I believe that these feelings are valid and important.	①	②	③	④	⑤
16. I feel like I am weak.	①	②	③	④	⑤
17. I am clear about my feelings.	①	②	③	④	⑤
18. I believe that there is nothing that I can do to make myself feel better.	①	②	③	④	⑤
19. I am paying attention to my feelings.	①	②	③	④	⑤
20. I am embarrassed for feeling this way.	①	②	③	④	⑤
21. I am starting to feel very bad about myself.	①	②	③	④	⑤
22. I am irritated with myself for feeling this way.	①	②	③	④	⑤
23. I know that I can find a way to eventually feel better.	①	②	③	④	⑤
24. My emotions feel overwhelming	①	②	③	④	⑤
25. I'm taking time to figure out what I'm really feeling.	①	②	③	④	⑤
26. I feel like I can remain in control of my behaviors.	①	②	③	④	⑤

- | | | | | | |
|---|---|---|---|---|---|
| 27. I am having difficulty concentrating. | ① | ② | ③ | ④ | ⑤ |
| 28. I experience my emotions as overwhelming and out of control. | ① | ② | ③ | ④ | ⑤ |
| 29. When I feel the way I do now, I have difficulty getting work done. | ① | ② | ③ | ④ | ⑤ |
| 30. I am out of control. | ① | ② | ③ | ④ | ⑤ |
| 31. I am having difficulty thinking about anything other than my feelings | ① | ② | ③ | ④ | ⑤ |
| 32. When I feel as I do now, I have difficulty controlling my behaviors. | ① | ② | ③ | ④ | ⑤ |
| 33. I feel out of control | ① | ② | ③ | ④ | ⑤ |
| 34. When I feel as I do now, I can still get things done. | ① | ② | ③ | ④ | ⑤ |
| 35. When I feel as I do now, I have difficulty focusing of other things. | ① | ② | ③ | ④ | ⑤ |
| 36. When I feel as I do now, I lose control over my behaviors. | ① | ② | ③ | ④ | ⑤ |

Appendix D

Flow State Scale (FSS)

Flow State Scale

Please answer the following questions in relation to your experience in the event you have just completed. These questions relate to the thoughts and feelings you may have experienced during the event. There are no right or wrong answers. Think about how you felt during the event and answer the questions using the rating scale below. Circle the number that best matches your experience from the options to the right of each question.

SD=Strongly Disagree

D=Disagree

N=Neither agree nor disagree

A=Agree

SA=Strongly Agree

1. I was challenged, but I believed my skills would allow me to meet the challenge.	SD	D	N	A	SA
2. I made the correct movements without thinking about trying to do so.	SD	D	N	A	SA
3. I knew clearly what I wanted to do.	SD	D	N	A	SA
4. It was really clear to me that I was doing well.	SD	D	N	A	SA
5. My attention was focused entirely on what I was doing.	SD	D	N	A	SA
6. I felt in total control of what I was doing.	SD	D	N	A	SA
7. I was not concerned with what others may have been thinking of me.	SD	D	N	A	SA
8. Time seemed to alter (either slowed down or speeded up).	SD	D	N	A	SA
9. I really enjoyed the experience.	SD	D	N	A	SA
10. My abilities matched the high challenge of the situation.	SD	D	N	A	SA
11. Things just seemed to be happening automatically.	SD	D	N	A	SA
12. I had a strong sense of what I wanted to do.	SD	D	N	A	SA
13. I was aware of how well I was performing.	SD	D	N	A	SA
14. It was no effort to keep my mind on what was happening.	SD	D	N	A	SA
15. I felt like I could control what I was doing.	SD	D	N	A	SA
16. I was not worried about my performance during the event.	SD	D	N	A	SA
17. The way time passed seemed to be different from normal.	SD	D	N	A	SA
18. I loved the feeling of that performance and want to capture it again.	SD	D	N	A	SA
19. I felt I was competent enough to meet the high demands of the situation.	SD	D	N	A	SA
20. I performed automatically.	SD	D	N	A	SA
21. I knew what I wanted to achieve.	SD	D	N	A	SA
22. I had a good idea while I was performing about how well I was doing.	SD	D	N	A	SA
23. I had total concentration.	SD	D	N	A	SA
24. I had a feeling of total control.	SD	D	N	A	SA
25. I was not concerned with how I was presenting myself.	SD	D	N	A	SA
26. It felt like time stopped while I was performing.	SD	D	N	A	SA
27. The experience left me feeling great.	SD	D	N	A	SA
28. The challenge and my skills were at an equally high level.	SD	D	N	A	SA
29. I did things spontaneously and automatically without having to think.	SD	D	N	A	SA
30. My goals were clearly defined.	SD	D	N	A	SA
31. I could tell by the way I was performing how well I was doing.	SD	D	N	A	SA
32. I was completely focused on the task at hand.	SD	D	N	A	SA
33. I felt in total control of my body.	SD	D	N	A	SA
34. I was not worried about what others may have been thinking of me.	SD	D	N	A	SA
35. At times, it almost seemed like things were happening in slow motion.	SD	D	N	A	SA
36. I found the experience extremely rewarding.	SD	D	N	A	SA

Appendix E

Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS)

BIS/BAS scales

Several theorists have argued that two general motivational systems underlie behavior. A behavioral approach system (BAS) is believed to regulate appetitive motives, in which the goal is to move toward something desired. A behavioral avoidance (or inhibition) system (BIS) is said to regulate aversive motives, in which the goal is to move away from something unpleasant. We developed the BIS/BAS scales to assess individual differences in the sensitivity of these systems.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology*, 67, 319-333.

Here is how we administer the BIS/BAS scales here, followed by scoring instructions:

BIS/BAS

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

- 1 = very true for me
- 2 = somewhat true for me
- 3 = somewhat false for me
- 4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.

11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.
21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

Items other than 2 and 22 are reverse-scored.

BAS Drive: 3, 9, 12, 21 BAS Fun Seeking: 5, 10, 15, 20 BAS Reward Responsiveness: 4, 7,
14, 18, 23

BIS: 2, 8, 13, 16, 19, 22, 24

Items 1, 6, 11, 17, are fillers.

The fact that there are three BAS-related scales and only one BIS-related scales was not planned or theoretically motivated. The factors emerged empirically, from an item set that was intended to capture diverse manifestations of the BAS, according to various theoretical statements. It is likely that a broader sampling of items on the BIS side would also have resulted in more than one scale. I do not encourage combining the BAS scales, however, because they do turn out to focus on different aspects of incentive sensitivity. In particular, Fun Seeking is known to have elements of impulsiveness that are not contained in the other scales.

Appendix F

Experience Evaluation Questionnaire (EEQ)

Experience Evaluation Questionnaire (Pre Challenge)

Before attempting to complete the rock climb that has been described to you, please answer the following questions regarding your expectations about the experience.

	Low	Moderate	High
1. How challenging do you expect the climb will be for you?	L	M	H
2. How would you assess your level of skills to complete the climb?	L	M	H
3. How would you rate your competence in undertaking this activity at this time?	L	M	H
4. How would you rate the level of risk for you in the activity at this time?	L	M	H

How fearful do you expect you will be during the climb?
(Make an X on the arrow at the appropriate spot)



Experience Evaluation Questionnaire (Post Challenge)

Now that you have attempted the rock climb, please answer the following questions about your experience.

	Low	Moderate	High
1. How challenging was the climb for you?	L	M	H
2. How would you assess your level of skills to complete the climb?	L	M	H
3. How would you rate your competence in undertaking this activity at this time?	L	M	H
4. How would you rate the level of risk for you in the activity at this time?	L	M	H

How fearful were you during the climb?
(Make an X on the arrow at the appropriate spot)



Rate your success on the climbing activity. (Circle one)

1 2 3 4

Completely Failed Mostly Failed Mostly Succeeded Completely Succeeded

Experience Evaluation Questionnaire (Follow-up)

You participated in a study where you attempted a climb at the University of Montana climbing gym. Please describe your experience attempting this climb in your own words (describe your thoughts, feelings, reactions, etc.)

Below is a list of statements regarding participation in the rock climbing experience. Please rate your agreement with each statement. Circle (click) **SA** for **Strongly Agree**, **A** for **Agree**, **U** for **Undecided**, **D** for **Disagree**, and **SD** for **Strongly Disagree**.

	SA	A	U	D	SD
1. I enjoyed the experience.	SA	A	U	D	SD
2. I found the experience difficult.	SA	A	U	D	SD
3. I was embarrassed during the experience.	SA	A	U	D	SD
4. I would participate again.	SA	A	U	D	SD
5. I was scared during the experience.	SA	A	U	D	SD
6. I felt good about myself after the experience.	SA	A	U	D	SD
7. I was proud of what I accomplished.	SA	A	U	D	SD
8. I feel more confident as a result of the experience.	SA	A	U	D	SD

Have you gone to the rock climbing gym to climb again since the study? Y N

Have you done similar (challenging) activities since? Y N

If yes, please list them:

Would you have done these activities if you had not participated in the study? Y N

How do you think participating in this study has affected you as a person (if at all)?

Appendix G

Tennessee Self-concept Scale (TSS)

Tennessee Self-concept Scale (TSCS)

Please refer to Western Psychological Services for a copy of this measure.

Contact information:

800-648-8857

www.wpspublish.com

Appendix H

Regulatory Emotional Self-efficacy Scale (RESE)

Emotional Self-Efficacy Scale

<p>Please rate how confident you are that, as of now, you can do the following</p> <p><i>After reading each item please indicate your response by marking the appropriate number</i></p>	Not at all confident	A little confident	Moderately confident	Quite confident
1. Correctly identify your own negative emotions	1	2	3	4
2. Help another person change a negative emotion to a positive emotion	1	2	3	4
3. Create a positive emotion when feeling a negative emotion	1	2	3	4
4. Know what causes you to feel a positive emotion	1	2	3	4
5. Correctly identify when another person is feeling a negative emotion	1	2	3	4
6. Use positive emotions to generate novel solutions to old problems	1	2	3	4
7. Realize what causes another person to feel a positive emotion	1	2	3	4
8. Change your negative emotion to a positive emotion	1	2	3	4
9. Correctly identify your own positive emotions	1	2	3	4
10. Generate in yourself the emotion another person is feeling	1	2	3	4
11. Know what causes you to feel a negative emotion	1	2	3	4
12. Regulate your own emotions when under pressure	1	2	3	4
13. Correctly identify when another person is feeling a positive emotion	1	2	3	4
14. Get into a mood that best suits the occasion	1	2	3	4
15. Realise what causes another person to feel a negative emotion	1	2	3	4

16. Help another person to regulate emotions when under pressure	1	2	3	4
17. Notice the emotion your body language is portraying	1	2	3	4
18. Use positive emotions to generate good ideas	1	2	3	4
19. Understand what causes your emotions to change	1	2	3	4
20. Calm down when feeling angry	1	2	3	4
21. Notice the emotion another person's body language is portraying	1	2	3	4
22. Create emotions to enhance cognitive performance	1	2	3	4
23. Understand what causes another person's emotions to change	1	2	3	4
24. Help another person calm down when he or she is feeling angry	1	2	3	4
25. Recognize what emotion you are communicating through your facial expression	1	2	3	4
26. Create emotions to enhance physical performance	1	2	3	4
27. Figure out what causes you to feel differing emotions	1	2	3	4
28. Regulate your own emotions when close to reaching a goal	1	2	3	4
29. Recognize what emotion another person is communicating through his or her facial expression	1	2	3	4
30. Generate the right emotion so that creative ideas can unfold	1	2	3	4
31. Figure out what causes another person's differing emotions	1	2	3	4
32. Help another person regulate emotions after he or she has suffered a loss	1	2	3	4

Appendix I

Belayer encouragement scale

Belayer Encouragement Scale

For this participant, how much encouragement did you give to help them reach their goals?



NONE



SOME



CONSIDERABLE



A LOT



EXTENSIVE

Comments:

Appendix J

Description of the Climbing Experience

Appendix J

Description of Climbing Experience

You will be asked to attempt a beginner level climb at the University of Montana artificial climbing wall in the recreation center. You will be provided with a harness and climbing shoes. A climbing wall employee will assist you in properly fitting your harness and attaching the climbing rope to your harness. You will be given basic instructions on climbing techniques. The climbing wall employee will be attached to the other end of the climbing rope, such that he/she will be able to catch you if you should fall. The climb is approximately 30 feet long. You do not have to reach the top of the climb, and may discontinue at any time. Once you have gone as far as you are willing to go, you will sit into your harness and the climbing wall employee will lower you to the ground.

There are inherent risks in participating in such activities. If you have any health conditions that would prohibit you from participating or may cause difficulty for you in participating, please let the researcher know.

Before you attempt the climb, you will need to fill out some questionnaires provided by the researcher.

Appendix K

University of Montana Climbing Wall Liability Waiver



University of Montana
CAMPUS RECREATION

Name _____ Belay Certified at UM _____ (y/n)

Address _____

Phone _____ # Years Climbing _____

Age _____ Category _____ Male _____ Female _____

PARTICIPANT AGREEMENT, RELEASE, ASSUMPTION OF RISK

In consideration of the services of the University of Montana, their agents, officers, volunteers, participants, employees and all other persons or entities acting in any capacity on their behalf (hereinafter collectively referred to as UM), I hereby agree to release, indemnify, and discharge UM, on behalf of myself, my children, my parents, my heirs, assigns, personal representative and estate as follows:

- 1. I acknowledge that rock climbing on an artificial, indoor climbing wall entails known and unanticipated risks that could result in physical or emotional injury, paralysis, death, or damage to myself, property or to third parties. I understand that such risks simply cannot be eliminated without jeopardizing the essential qualities of the activity.

The risks include, among other things, falling off the wall; loose and/or damaged artificial holds; rented equipment failure; falling to the ground, on other users, or being fallen on by other users; abrasions from the walls, ropes, pads, or the floor; equipment failure; belay and/or belayer failure; climbing out of control or beyond one's personal limits; the negligence of other climbers, visitors, participants, or other persons who may be present; musculoskeletal injuries and/or overtraining; head injuries; or my own negligence. Furthermore, UM employees have difficult jobs to perform. They seek safety, but they are not infallible. They might be unaware of a participant's fitness or abilities. They may give inadequate warnings or instructions, and the equipment being used might malfunction.

- 2. I expressly agree and promise to accept and assume all of the risks existing in this activity. My participation in this activity is purely voluntary, and I elect to participate in spite of the risks.
- 3. I hereby voluntarily release, forever discharge, and agree to indemnify and hold harmless UM from any and all claims, demands, or causes of action, which are in any way connected with my participation in this activity or my use of UM's equipment or facilities including any such claims which allege negligent acts or omissions of UM.
- 4. Should UM or anyone acting on their behalf, be required to incur attorney's fees and costs to enforce this agreement, I agree to indemnify and hold them harmless for all such fees and costs.
- 5. I certify that I have adequate insurance to cover any injury or damage I may cause or suffer while participating, or else I agree to bear the costs of such injury or damage myself. I further certify that I am willing to assume the risk of any medical or physical condition I may have.
- 6. I agree that if any portion of this agreement is found void or unenforceable, the remaining portions shall remain in full force and effect.

By signing this document, I acknowledge that if anyone is hurt or property is damaged during my participation in this activity, I may be found by a court of law to have waived my right to maintain a lawsuit against UM on the basis of any claim from which I have released them herein. I have had sufficient opportunity to read this entire document. I have read and understood it, and I agree to be bound by its terms.

Signature of participant _____

Date _____

PARENT'S OR GUARDIAN'S ADDITIONAL INDEMNIFICATION (Must be completed for participants under the age of 18)
In consideration of _____ (print minor's name) being permitted by UM to participate in its activities and to use its equipment and facilities, I further agree to indemnify and hold harmless UM from any and all Claims which are brought by, or on behalf of Minor, and which are in any way connected with such use or participation by Minor.

Parent or Guardian: _____ Print Name _____

OFFICE USE ONLY
Paid _____ Type _____
Date _____
Receipt # _____