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Increasing and Generalizing Self-Efficacy

The Effects of Adventure Recreation on the Academic Efficacy of Early Adolescents

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Abstract

This quasi-experimental study examined the impact of an adventure recreation program on adolescent participants' outdoor recreation and academic self-efficacy. The study also explored the transferability of efficacy beliefs across non-related domains. The sample included 262 adolescents, 194 who served as participants in the program and 68 who served as comparisons. The average age for each group was 13.6 years. The intervention, a two-week, theory-based program, involved a variety of outdoor recreation activities. Pre-/post-instruments measured perceived levels of outdoor efficacy and academic efficacy, attitudes, and motivations. Results indicated participants experienced significantly more growth than comparisons on both outdoor and academic measures and a small, yet significant, relationship existed for participants between the growth across outdoor and academic efficacy.

Keywords: *self-efficacy; adventure recreation; theory-based programming; efficacy generalizability; summer learning loss; quasi-experimental designs*

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Introduction

Youth inhabit a variety of contexts (e.g., home, school, work, out-of-school, etc.), which each exert varying degrees of developmental influence. While large bodies of literature exist looking at the impact of specific contexts on youth (e.g., structured out-of-school time contexts; Mahoney, Larson, & Eccles, 2005), bidirectional influences across contexts have received less attention. Research has examined some cross contextual connections like the influence of parenting on academics (Hughes & Kwok, 2007; Jeynes, 2007; Nancy & Lorraine, 2004; Rogers, Wiener, Marton, & Tannock, 2009) and the out-of-school context of sports (Green & Chalip, 1997; Holt, Tamminen, Black, Sehn, & Wall, 2008; Hoyle & Leff, 1997), but many other cross-context relationships have received little or no attention.

Research focusing on the potential connections between structured, out-of-school time (OST) contexts and school contexts may be an important addition to the existing literature. The developmental processes inherent in many structured out-of-school time programs may conceptually overlap with school day learning; yet, these potential connections remain largely unexamined. For example, we know well designed, high-quality youth programs can foster substantial development impacts (e.g., emotional competence, resilience, identity, etc.; Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004), but do these outcomes generalize to actual school engagement and performance? It seems this generalization anecdotally and theoretically occurs, but additional evidence is needed.

Research looking specifically at after-school programs represents an important exception to out-of-school/school cross-contextual research. For example, a Harvard Family Research Project review (Little, Wimer, & Weiss, 2008) highlighted the wide variety of academic-related benefits associated with participation in after-school programs including increases in reading and math achievement, school attendance, and homework completion rates. This same review also linked after-school program participation and a host of social/emotional (e.g., development of initiative, less behavioral problems, etc.) and prevention (e.g., less juvenile crime) outcomes.

While the after-school program research represents an important contribution to better understanding the relationship between school and out-of-school contexts, after school programs represent a unique type of out-of-school time context. For example, after-school programs are usually more connected to the school day than other structured out-of-school contexts. Most after-school programs occur within schools and often include school day curriculum aligned programming in addition to mandatory homework help. This close connection between after-school programs and the regular school day stands in contrast to many other structured out-of-school time opportunities like organized sports, clubs (e.g., 4-H), arts and music, and summer camps.

Thus, research is needed to know if out-of-school contexts without explicit links relate back to school, and if such contexts do, understand how this is accomplished. The need to study out-of-school and school context connections may be especially pertinent in terms of understanding if and how summer time, structured youth contexts impact factors associated with academic performance. As it becomes increasingly obvious that large numbers of youth are experiencing significant amounts of summer learning loss (Phillips & Chin, 2004), the impetus to understand what types of structured summer contexts for youth may positively influence academic-related variables grows. Additionally, the examination of the structure and processes of such programs is needed to understand how such experiences interact with the academically related variables.

Self-efficacy theory (Bandura, 1997) appears to provide a viable theoretical framework to examine and potentially explain linkages between out-of-school and school contexts. In addi-

tion to explaining the connection between personal perceptions of competence and actual performance, self-efficacy theory also posits the ability of self-efficacy beliefs to generalize from one task or context to another. Research findings suggest generalization can occur across both similar and dissimilar tasks/contexts (Bandura, 1997; Cervone, 2005; Weitlauf, Cervone, Smith, & Wright, 2001). Thus, theoretical justification exists for investigating the possibility that outcomes resulting from participation in out-of-school time contexts may positively generalize back to school contexts.

The purpose of this study was to investigate, using a self-efficacy framework, the impact of a summer adventure recreation program for youth on academic efficacy, attitudes, and motivations. The program was intentionally designed and implemented using self-efficacy theory as a guiding programmatic approach.

Review of Literature

Structured Out-of-School Time Contexts

Larson (2000) identified initiative (i.e., the ability to maintain self-motivated involvement over an extended period of time on a challenging task) as a core component of positive youth development. Further, he suggested initiative emerges in part as a result of adolescents' daily experiences across the various contexts they frequent (e.g., school, free time, home, etc.). In his research of contexts promoting the development of initiative, Larson classified structured, voluntary, out-of-school settings as the most effective catalysts of initiative development, intrinsic motivation and concentration. These were the only contexts, in comparison to hanging out with friends and school.

Although North American adolescents spend the majority of their time in out-of-school/free time contexts (Larson & Verma, 1999), this period has largely been overlooked and understudied over the last 100 years (Kleiber & Powell, 2005). Both policy and research on out-of-school time activities, and on structured out-of-school time contexts, have received increased attention over the last few decades (e.g., Mahoney et al., 2005). An expansive body of literature now details the host of positive benefits associated with youth participation in high-quality out-of-school time contexts (e.g., Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002; Lerner et al., 2005; Witt & Crompton, 2002).

Although some research specifically examines potential connections between out-of-school contexts and the school day, the focus is primarily on after school and school based programs (e.g., Springer & Diffily, 2012). Less research has attempted to link non-school based, structured out-of-school time contexts back to the school day. This is especially true of summertime camps and adventure recreation programs. Little research exists linking adolescent participation in adventure recreation back to academically relevant variables. One exception is a study examining the impact of a six-week challenge course on urban youth's academic performance (Salibrici, 2012). Although the results produced no statistically significant connections between participation in the program and academic performance, positive trends in the data did emerge. While meaningful connections may exist between summer-based adventure recreation programs and academic performance, more research is needed to understand if and how this relationship exists.

Summer Learning Loss

For the last 20 years, concerns linking poor academic performance to insufficient time spent in structured, educational contexts has drawn researchers to look closely for evidence to

substantiate this connection (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; McMullen & Rouse, 2012). Studies on lengthening the school year (Elam, Rose, & Gallop, 1996; Gandara & Fish, 1994; Huebner, 2010; McMullen & Rouse, 2012; Patell, Cooper, & Allen, 2010) and rearranging school breaks to be shorter but more frequent (Ballinger, Kirschenbaum, & Poimbeauf, 1987; Helf, Konrad, & Algozzine, 2008) have indicated academic performance improves when students spend time being taught by a teacher in a formal educational setting. Traditional three-month *summer vacations* represent a major break from formal education. Cooper et al. (1996) stated, "The long vacation breaks the rhythm of instruction, leads to forgetting, and requires that a significant amount of time be spent on review of old material when students return to school in the fall" (p. 228). This gap in learning is documented in several studies and is labeled as *summer learning loss* (Alexander, Entwisle, & Olsen, 2007; Allington & McGill-Franzen, 2003; Cooper et al., 1996; Helf et al., 2008; Huebner, 2010; Mraz & Rasinski, 2007; Patell et al., 2010; Skibbe, Grimm, Bowles, & Morrison, 2012). This loss is more apparent among low income and disadvantaged youth in contrast to youth from higher income families with more privileges (Allington & McGill-Franzen, 2003; Kim & Guryan, 2010).

Cooper et al.'s (1996) meta-analysis of studies on the effects of summer vacation on achievement test scores concluded there is a decline in test scores after the vacation period and there is a slight accumulative effect as years of schooling progress. This indicates summer learning loss occurs and requires teachers to spend additional time at the beginning of the school year to review material from the previous year. Cooper et al.'s recommendations include the need for school administrators to consider opportunities for students, especially disadvantaged youth to participate in learning environments of some kind to curtailed this summer learning loss. Whether this comes in the form of formal summer schools and/or formal summer camps, all present such opportunities.

Adventure Recreation

Adventure recreation is the most commonly used umbrella term for programs involving challenging outdoor activities (Ewert, 1987). Adventure recreation has been used as a programming modality since the days of Kurt Hahn's early Outward Bound programming in the 1940s. Since that time, there has been a rapid increase in the development of programs for a wide variety of populations using adventure recreation as a core component (Ewert, 1987; Hattie, Marsh, Neill, & Richards, 1997). Hattie et al. (1997) identified the following features of adventure recreation programs:

> (a) wilderness or backcountry settings; (b) a small group (usually less than 16); (c) assignment of a variety of mentally and/or physically challenging objectives, such as mastering a river rapid or hiking to a specific point; (d) frequent and intense interactions that usually involve group problem solving and decision making; (e) nonintrusive, trained leader; and (f) a duration of 2 to 4 weeks. (p. 44)

Other terms like *outdoor education* and *challenge or adventure education* are also used depending upon the specific purpose of the program (Ewert, 1987).

Early research on the efficacy of adventure recreation programs was promising but somewhat marred due to questionable methodology and overreliance on anecdotal evidence (Hattie et al., 1997). Meta-analyses conducted during the 1990s and early 2000s (Cason & Gillis, 1994; Hanna, 1995; Hattie et al., 1997; Neill & Richards, 1998; Wilson & Lipsy, 2000) suggest some adventure recreation programs positively impacted participants' self-concept, confidence, locus of control, and leadership. The most effective programs exposed participants to challenging activi-

ties, lasted at least 20 days, and involved adult participants (Hattie et al., 1997; Wilson & Lipsy, 2000).

More recent and methodologically rigorous research has linked youth adventure recreation programming with positive identity development (Duerden, Taniguchi, & Widmer, 2012; Duerden, Widmer, Taniguchi, & McCoy, 2009), increased spirituality (Griffin & LeDuc, 2009), and conflict resolution skills (Wells, Widmer, & McCoy, 2004). Hattie et al. (1997) suggested adventure programs facilitate positive growth because they place participants in situations which produce naturally occurring consequences), involve specific tasks and goals, and provide ample interpersonal and environmental feedback.

Self-efficacy

Bandura's (1997) work in self-efficacy demonstrates efficacy beliefs are the best predictor of future performance. Self-efficacy and the associated outcome expectancies influence motivation and persistence in the face of challenge and adversity (Pajares, 1997). Pajares (1997) found these beliefs influence activities people choose to participate in or avoid. People tend to avoid situations and contexts they believe present challenges beyond their abilities. Conversely, people will readily engage in tasks they believe they can complete:

> Any factor that influences choice of behavior can have profound effects on the course of development. Advantageous self-precepts of efficacy that foster active engagement in activities contribute to the growth of competencies. In contrast, perceived self-inefficacy's that lead people to shun enriching environment and activities retard development of potentialities and shield negative self-precepts from corrective change. (Bandura, 1986, p. 393).

Clearly, individuals reap substantial benefits from strong efficacy beliefs.

Early adolescence is a critical time in development. Struggling youth can benefit from powerful efficacy experiences that bolster their self-perceptions (Holden, Moncher, Schinke, & Barker, 1990). Designing efficacy-enhancing experiences targeted at key areas of competencies, such as academic efficacy and social efficacy, holds the potential to positively influence development. Bandura's (1997) writings and research describe the specific mechanisms effecting efficacy judgments: enactive attainment, vicarious experience, verbal persuasion, and physiological arousal. Some research in the leisure literature has examined the use of recreation modalities to increase self-efficacy in an effort to promote perceived freedom and personal control (Elias & MacDonald, 2007; Ellis, Maughan-Pritchett, & Ruddell, 1993; Maughan & Ellis, 1991). Increasing efficacy in an area of life functioning or skills has direct benefits.

Sources of efficacy information. Bandura (1986, 1997) identified four sources of efficacy information: (a) enactive attainment, (b) vicarious experience, (c) verbal persuasion, and (d) physiological arousal. Each source can be powerful, but when used strategically in combination, they can be more informative than when used independently.

Enactive mastery experiences are the most influential source of efficacy information. Enactive mastery involves the actual experience of engaging in a task. The power of these experiences depends upon a number of factors, including the difficulty of the task, the pattern of success and failure, the amount of effort expended, the amount of external aid received, and the circumstances under which the task is performed (Bandura, 1997). Tasks where difficulty slightly exceeds the participant's ability provide meaningful challenge and promote efficacy beliefs.

Vicarious experience is the use of modeling, or other mental or visual cues to affect efficacy judgments. Weak efficacy beliefs can be enhanced by observing models, who posses similar

characteristics to the participant, successfully complete a task. This is particularly true where the observer has little experience with the task and is therefore uncertain, or has experienced significant past failure. Bandura (1997) suggests, "Persons who are similar or slightly higher in ability provide the most informative comparative information for gauging ones own capabilities" (p. 96).

Verbal persuasion is feedback provided to direct and enhance performances. It may include encouragement, directions, and other information necessary to improve performances. A number of factors influence the effectiveness of verbal persuasion in promoting efficacy beliefs. For example, specific feedback provides the most useful information. Specific feedback addresses exact behaviors or processes and allow recipients to make corrective adjustments resulting in improved performance (Bandura, 1997).

Physiological arousal is the physical response to emotional cues. For example, fear elicits an increased heart rate, higher blood pressure, and muscle tension. Fear may also produce sweating, physical shaking, and more. Such physiological states can undermine efficacy, especially when one's perception of efficacy for the specific task is low. When a physiological state is recognized and managed, however, the result can be an enhancement of efficacy. Individuals with high efficacy are likely to interpret arousal in a way that energizes. "Affective states can... enhance physical status, reduce stress levels and negative emotional proclivities, and correct misinterpretations of bodily states" (Bandura, 1997, p. 106). Learning to recognize and respond to these states can enhance efficacy.

Generalizability of efficacy beliefs. One of the unique aspects of self-efficacy theory is the phenomenon of generalization. Bandura (1997) suggests increases in efficacy are likely to generalize within activity domains. Increases in efficacy, however, may also generalize across domains to activities that are substantially different (Bandura, 1997; Cervone, 2005; Weitlauf et al., 2001). Schunk and Pajares (2003) highlight the need for more research related to the generalizability of self-efficacy beliefs.

According to Bandura (1997), "Powerful mastery experiences that provide striking testimony to one's capacity to effect personal changes can also produce transformational restructuring of efficacy beliefs that is manifest across diverse realms of functioning" (p 53). Indeed, mastery experiences can produce transformations in the way we think about our potential and abilities. Five methods can be used to promote generalization of efficacy across domains: (a) overwhelming mastery experiences, (b) identification of similar subskills, (c) co-development of sub-skills, (d) cognitive restructuring of efficacy beliefs and (e) generalizing subskills (Bandura, 1997, pp. 50-54).

Academic efficacy. Academic efficacy is critical because youth with high efficacy are more likely to persist and succeed in the face of difficulty in school (Pajares, 2003). The literature strongly supports a positive connection between academic efficacy, motivation, and success (Multon, Brown, & Lent, 1991). For example, self-efficacy beliefs have been shown to play predictive and mediating roles in relation to academic performance variation and academic performance respectively among post graduate students (Lane & Lane, 2001; Lane, Lane, & Kyprianou, 2004). Self-efficacy beliefs have also exhibited stronger predictive abilities of college performance than past academic performance (Elias & MacDonald, 2007).

Research also suggests the same power of academic efficacy seen with college-aged samples also applies to younger youth as well. For example, in an international sample of youth between the ages of 15 to 19 years who reported high levels of academic self-efficacy also reported high academic aspirations (Bassi, Steca, Fave, & Caprara, 2007). Research has shown strong positive

connections between writing efficacy and writing motivations with success among elementary, middle, and high school students (Pajares, 1997, 2003). Klassen's (2002) review of writing efficacy studies provides further support of the importance of efficacy in the key academic subdomain of writing.

While the importance and influence of academic efficacy on academic success is strongly supported by the literature, less is known about the ability of self-efficacy gains in nonacademic domains to influence academic efficacy. If such a potential for nonacademic self-efficacy to transfer to increases in academic self-efficacy perceptions, it seems imperative to know of such a relationship and what makes a positive transfer of self-efficacy perceptions from one domain to another.

Summary and Hypotheses

This study investigated the ability of a theoretically based OST program to promote academic-related outcomes. Because confidence in academic ability is critical to academic success (Pajares & Schunk, 2005), we sought to investigate the effectiveness of increasing outdoor efficacy and systematically generalizing increases to academic efficacy. Using recreation to affect academic efficacy represents an area in need of additional research. Adventure recreation activities provide a powerful modality to increase self-efficacy because they are characterized by challenge, perceived risk, intrinsic motivation, and positive affect (Hattie et al., 1997). Level of challenge and risk may be intentionally balanced in adventure recreation to meet participants' skill level.

This study sought to employ strategies, intentionally utilizing Bandura's sources of efficacy, to increase participants' self-efficacy in specific, novel, and challenging outdoor recreational activities. Program strategies also included the identification of similar subskills and cognitive restructuring to promote generalizations of the increases in self-efficacy from nonacademic domains to academic domains. Based upon the reviewed literature, the following hypotheses were developed and tested at a .05 significance level:

H_1. Adventure recreation participants would experience significantly greater growth on the outcome measures than the comparison group.

H_2. A positive relationship would exist between adventure recreation participants' growth on the outdoor efficacy and academic efficacy related measures.

Methods

Participants

The Human Subjects Review Board at the authors' university approved all procedures for this study. One hundred ninety-four individuals (59% male and 41% female) were included in the participant group, and 68 individuals (56% male and 44% female) served as comparisons. Eighty percent of the participant group and 60% of the comparison group were White. Hispanics made up the largest minority group at 11% for participants and 23% for comparisons. The average age for the participant group was 13.2 years (SD = .973) and 13.7 years (SD = 1.25) for the comparisons. Participants were drawn from the 2004–2007 yearly program cycles of the observed adventure recreation program whereas comparison members came from 2004, 2005, and 2007. Participant recruitment occurred through newspaper articles, flyers, school counselors, social workers, and middle school newsletters and assemblies. Although no randomization occurred during participant and comparison group assignments, a nonequivalent control group (Babbie, 2005) was used. Thus, comparison and participant groups were drawn from similar, but

not identical, populations. For this study, the comparison group was recruited from two of the same middle schools that produced portions of the participant group.

Measures

Measures of outdoor recreation efficacy were developed following Bandura's (2006) guidelines for constructing self-efficacy scales. Scale development focused on identifying content representative tasks based on gradation of challenge and writing items asking what people can do, rather than what they have done. These measures included a whitewater rafting efficacy scale (26 items; 0 [certainly can]-100 [certainly cannot] response scale) and a backpacking efficacy scale (25 items; 0-100 response scale). For both scales, respondents were asked to indicate their confidence in their ability to complete a variety of outdoor tasks (e.g., "I can scout a river," "I can apply basic river safety," and "I can build a shelter"). Cronbach's alphas for both scales were greater than .90.

Academic efficacy, attitudes, and motivations were all measured in this study using scales obtained from Pajares and Schunk (personal communication, April, 2004). The decision to measure academic attitudes and motivations in addition to academic efficacy was based upon the theoretical linkage between these constructs. Self-efficacy theory suggests high efficacy toward a certain behavior only results in actual behavior when linked with positive outcome expectancies (i.e., attitudes and motivations) toward the end result of the behavior. In other words, although individuals may feel confident in their ability to perform well in school, they will only apply themselves academically if they also have a positive attitude about school and the expected outcomes of academic success. The academic measures used a six-point Likert scale response format (definitely false to definitely true; not at all like me to very like me). Cronbach's alphas for all three scales ranged from .76 to .88 (see Table 1).

Procedures

The participant group completed a two-week, residential, adventure recreation program (the 2004 cohort's program was three weeks). The program was a collaborative venture between university researchers and a nonprofit organization specializing in adventure recreation programming for adolescents. University undergraduates were recruited to serve as field staff.

The field staff attended a semester long course introducing principles of self-efficacy theory and other topics relevant to program development. They completed readings on self-efficacy, attended lectures, and then worked to create a program to enhance recreation efficacy and generalize increases to academic efficacy. The readings and lectures emphasized the sources of efficacy information. In addition, Bandura's mechanisms of generalization were studied. After training, the staff worked with the research team to design activities and integrate the sources of efficacy and mechanisms of generalization. For example, rock climbing program was written to include a process of describing skills, followed by modeling skills (vicarious experience), followed by the participants engaging in the activity (enactive attainment) and the staff providing specific feedback (verbal persuasion) to promote efficacy. The programs were designed and conducted to continue until participants had mastered skills (enactive mastery experiences).

After each activity session, small group debriefings took place that focused on generalizing the skills and efficacy increases experienced during the activity's participation to academics and other life contexts. For example, as a result of learning how to rock climb, participants memorized the names of the equipment and knots used. They also learned how to strategize how best to climb a route safely. Staff pointed out to the participants they could quickly and effectively memorize, understand and apply key concepts within an activity they enjoyed and paid atten-

Table 1

Academic Scales

Scale	Items	α
Academic Attitude	I look forward to doing school work	0.86
	I like going to school	
	School work is fun	
	Compared to others in my grade I'm a good student	
	I get good grades	
	School work is easy	
	I'm not a good student	
	Learning how to be a good student is easy	
	I have always done well on school assignments	
Academic Efficacy	How well can you finish homework on time	0.88
	How well can you learn mathematics	
	How well can you study when there are other things to do	
	How well can you learn science	
	How well can you concentrate on school work	
	How well can you learn reading skills	
	How well can you remember material from class	
	How well can you learn to use computers	
	How well can you arrange place to study at home	
	How well can you learn social studies	
	How well can you motivate yourself to do school work	
	How well can you learn writing skills	
	How well can you participate in class discussions	
Academic Motivation	I do school assignments so teacher doesn't think others know more	0.76
	I want to do better than other students in class	
	I like school work I can learn from, even if I make mistakes	
	I do school work so others won't think I'm dumb	
	I would feel successful at school if I did better than other students	
	I do school assignments to learn new things	
	I might not participate in school to avoid looking stupid	
	I would feel good if I were the only who could answer teacher's question	
	I like assignments that make me think	
	One of my goals is not to look like I can't do my work	
	I like to show my teacher I'm smarter than other kids	
	I do school work to become a better student	
	It's important not to look stupid in class	
	Doing better than other students is important	
	I do my school work because I'm interested	
	I do my assignments so I won't embarrass myself	

tion to. Further, they performed a high-risk activity in front of peers and adults. Fundamentally, participants were shown they have the requisite abilities to be successful in school, to memorize, understand, and apply key concepts and perform under pressure.

Another aspect of increasing and generalizing efficacy dealt with helping participants understand the importance of perseverance. Debriefs focused on the perseverance required of participants during rock climbing in the face of exhaustion, muscle pain, and frustration. The fact they persevered in the face of challenging conditions while rock climbing was cognitively

restructured to help them realize these same abilities would help them succeed when facing the exhaustion, mental pain, and frustration inherent in academic pursuits. These processes of implementing sources of efficacy information and generalizing to academic efficacy were applied across all activities.

Staff also served as another key component of modeling to increase academic efficacy. Every staff member was a full time student at a large private university with very competitive admission standards. The staff actively shared their own academic goals and encouraged participants to seek academic success.

Participants were assigned to teams of 4 to 6 youth, each under the supervision of a male and female staff member, for a total of six teams per session. The program consisted of three different activity rotations: (a) backpacking, (b) whitewater rafting, and (c) exploration. During the backpacking rotation, the youth learned and implemented outdoor skills, such as backcountry cooking, first aid, and fly-fishing while on a self-supported wilderness hiking trip. The rafting rotation involved navigating a 30-mile stretch of the Main Salmon River where participants learned about river safety, equipment, and guiding. Each participant had opportunities to guide his or her team's raft down the river and through rapids. The exploration rotation involved mountain biking, rock climbing, team building activities, and environmental education. Between each rotation, participants took part in service projects (e.g., stream restoration, painting building, and brush removal) and a variety of group activities (e.g., kickball, campfire programs, talent shows, etc.).

Data were collected on the day the group traveled to the program (pre) and on the last day of the program (post). Comparison group members did not participate in any aspects of the adventure program. They completed pre- and posttest questionnaires over a two-week period.

Analysis

Data analysis began with the calculation of mean scores for each subscale. Repeated measures ANOVAs were employed to test the first hypothesis [a significant group (participant vs. comparison) x time of testing interaction would exist for all outcomes]. Hierarchical linear regressions were used to test hypothesis two (a positive relationship would exist between participants' growth on the outdoor efficacy and academic measures).

Results

Descriptive Statistics

In an effort to address concerns associated with external validity, due to the lack of randomization, one-way ANOVAs and Chi-Square tests were conducted to test for differences between the participants and comparisons on all preprogram subscale scores and demographics. Results from the ANOVAs revealed significant differences between the comparison and adventure recreation participant groups on the backpacking self-efficacy scale ($p < .001$) and the academic attitude ($p < .001$), efficacy ($p = .02$), and motivations ($p = .04$) scales. The analysis strategy focused on comparing differences in change over time between the participants and comparisons; therefore, the dissimilarities in baseline scores were not a significant concern. No significant differences existed between the two groups in terms of age or gender. A significant difference was shown to exist between the participants and comparisons for ethnicity ($\chi^2(3, 218) = 11.93$, $p < .001$), due to a greater ration of Hispanic respondents in the comparison group. One-way ANOVAs were also run for both the participants and comparisons across years on all preprogram measures. The only significant difference for either group existed for the participants on the

academic attitude ($p < .01$) and academic motivation scales ($p = .02$) suggesting some baseline differences existed for participant cohorts on these two measures. Table 2 contains descriptive data for the participants' and comparisons' scale scores.

Table 2

Descriptive Statistics

Scale	Group	N	Pre-test Scores	*SD*	N	Post-test Scores	*SD*	Δ Scores
Rafting Efficacy	Comparison	68	1133.37	644.20	67	1135.19	688.53	1.83
	Participant	192	1048.58	546.02	193	2123.74	432.12	1075.16
Backpacking Efficacy	Comparison	51	1314.22	636.87	51	1278.35	755.13	-35.86
	Participant	121	963.27	567.91	120	1716.72	605.11	753.44
Academic Attitudes	Comparison	68	4.46	0.80	67	4.16	1.51	-0.31
	Participant	193	3.97	1.02	192	4.27	1.02	0.29
Academic Efficacy	Comparison	68	4.54	0.69	67	4.12	1.44	-0.42
	Participant	193	4.24	0.94	192	4.40	0.94	0.16
Academic Motivations	Comparison	68	3.96	0.62	66	3.61	1.25	-0.35
	Participant	191	3.76	0.74	191	3.85	0.79	0.09

Hypothesis One

The first hypothesis was fully supported by the findings from the repeated measures ANOVA's. For rafting efficacy, results revealed a significant main effect for time of testing ($F(1, 256) = 187.24$, $p < .001$, $\eta^2 = .42$) and group x time of testing interaction effect ($F(1, 256) = 192.4$, $p < .001$, $\eta^2 = .43$). For backpacking efficacy, results revealed a significant main effect for time of testing ($F(1, 168) = 59.65$, $p < .001$, $\eta^2 = .26$) and group x time of testing interaction effect ($F(1, 168) = 72.08$, $p < .001$, $\eta^2 = .30$). These findings indicate the participant group experienced a significant pre- to post-test increase on both rafting and backpacking efficacy scales in relation to the comparisons.

For the academic attitude scale, results revealed only a significant group x time of testing interaction effect ($F(1, 256) = 24.90$, $p < .001$, $\eta^2 = .09$). For the academic efficacy scale, results revealed a significant main effect for time of testing ($F(1, 256) = 4.711$, $p = .03$, $\eta^2 = .02$) and group x time of testing interaction effect ($F(1, 256) = 22.37$, $p < .001$, $\eta^2 = .08$). For the academic motivation scale, results revealed a significant group x time of testing interaction effect ($F(1, 256) = 10.32$, $p = .001$, $\eta^2 = .04$). In other words, the participants experienced significantly more positive academic attitude, efficacy, and motivation growth than the comparisons.

Hypothesis Two

In order to test for relationships over time between the outdoor and academic scales, separate hierarchical regression analyses (HRA) were run for each academic outcome. The post-program academic outcome scores were regressed upon their corresponding preprogram score (Block 1), age and gender (Block 2), and rafting efficacy (Block 3). Rafting efficacy was used in this assessment because it was administered across all four program years, thus allowing for a greater sample size for the analysis. The authors felt this was an appropriate representation of outdoor efficacy growth as there was a strong significant correlation between rafting and backpacking efficacy change scores ($r = .57$; one-tailed $p < .001$). Change scores were calculated by subtracting preprogram scores from post-program results.

Results from the academic attitude HRA (see Table 3) indicated Block 1 (preprogram academic attitude) accounted for 63% of the variance, Block 2's (age and gender) contribution was not significant, and Block 3 (rafting efficacy) explained an additional .8% of the variance. In the final equation, 2 of the 4 predictors, preprogram academic attitude (standardized β = .79, $p < .001$) and rafting efficacy (standardized β = .09, $p = .05$), proved significant. Results from the academic efficacy HRA (see Table 4) indicated Block 1 (preprogram academic efficacy) accounted for 53% of the variance in post-program academic efficacy and the other two blocks did not significantly explain any additional variance. Although it should be noted the standardized coefficient of rafting efficacy was approaching significance (standardized β = .09, $p = .07$). As with the first two HRAs, only Block 1 and Block 3 explained significant portions of the variance in post-program academic motivation, 48% and 3% respectively (see Table 5). The two significant coefficients from the model were preprogram academic motivation (standardized β = .48, $p < .001$) and rafting efficacy (standardized β = .17, $p = .008$). These findings indicate increases in rafting efficacy appear to have had a significant, albeit small, effect on participants' academic attitudes and motivation.

Table 3

Hierarchical Regression Results for the Prediction of Post-Program Academic Attitude Scores (n = 187)

Step/Predictor	R^2	ΔR^2	ΔF	*B*	*SE*	*β*
1. Pre-Program Academic Attitude	.63	.63	312.85**	.79	.18	.79**
2. Gender	.62	.002	.51	-.06	.09	-.03
Age				.005	.007	.03
3. Rafting Efficacy Change Score	.64	.008	3.92*	>.00	>.00	.09*

Note. Significant values and unstandardized and standardized regression coefficients reflect the results of the final regression equation. *$p < .05$. **$p < .01$

Table 4

Hierarchical Regression Results for the Prediction of Post-Program Academic Efficacy Scores (n = 187)

Step/Predictor	R^2	ΔR^2	ΔF	*B*	*SE*	*β*
1. Pre-Program Academic Efficacy	.53	.53	205.21**	.72	.05	.71**
2. Gender	.53	.005	1.05	-.12	.10	-.07
Age				.005	.007	.03
3. Rafting Efficacy Change Score	.54	.009	3.378	<.00	<.00	.09

Note. Significant values and unstandardized and standardized regression coefficients reflect the results of the final regression equation. *$p < .05$. **$p < .01$

Table 5

Hierarchical Regression Results for the Prediction of Post-Program Academic Motivation Scores (n = 187)

Step/Predictor	R^2	ΔR^2	ΔF	*B*	*SE*	*β*
1. Pre-Program Academic Motivation	.48	.48	55.61**	.50	.07	.48**
2. Gender	.48	.00	.04	-.03	.10	-.02
Age				-.004	.008	-.03
3. Rafting Efficacy Change Score	.51	.03	7.21*	<.00	<.00	.17*

Note. Significant values and unstandardized and standardized regression coefficients reflect the results of the final regression equation. *$p < .05$. **$p < .01$

Discussion

The purpose of this study was to examine the effectiveness of using adventure recreation to increase outdoor recreation efficacy and generalize it to a specific treatment outcome, academic efficacy. The methods of this study were designed in direct response to the critique provided by Davis-Berman and Berman (1994) of wilderness therapy research, which holds many methodological similarities to the adventure recreation research. Their critique included suggestions to use larger sample sizes, employ control and comparison groups, and utilize pre- and posttest designs and appropriate measures. Our sample included 262 individuals, employed a pre-/posttest, quasi-experimental design with treatment and comparison groups, and measures with high reliability. In addition, staff were recruited and completed training in self-efficacy theory and theory-based program design. They were taught how to introduce the sources of efficacy and generalize increases to academic efficacy. They also worked collaboratively with the researchers to design and implement the program.

Our findings fit in the broad literature indicating adventure recreation programs produce positive outcomes (Hattie et al., 1997). Participants in this program experienced significant growth on all outdoor and academic measures. Additionally, a significant relationship was found between outdoor efficacy and academic attitude and motivations. These findings suggest, when adventure recreation programs are based on sound theory, increases in targeted outcomes can be generalized across a variety of life skills. Using challenging outdoor recreation to increase efficacy and systematically generalizing increases to other areas of life functioning, such as academic efficacy, holds an important potential to help struggling youth. For example, in this study, the boys were able to learn to guide on whitewater, and they became familiar with river hydraulics, such as eddies, keepers, haystacks, and holes. Cognitive restructuring in-group discussions led the boys to seek the commonalities between river hydraulics and principles of physics they study in their 7th and 8th grade classes. The mechanisms of generalization discussed in the literature review can be used to effectively generalize increases in self-efficacy in outdoor recreation to domains such as academic efficacy.

A unique feature of this study was the consistent use of theory as a framework for staff training, collaborative program development, implementation, and evaluation. This degree of theory-based programming, from conceptualization to evaluation, meets the call for the integration of theory in practice valued in therapeutic recreation (Stumbo & Pegg, 2010; Stumbo & Wardlaw, 2011), youth development (Duerden & Gillard, 2011), and wilderness therapy (Davis-Berman & Berman,1994).

Self-efficacy theory suggests the participants' interest and efficacy will be positively influenced in future encounters with these issues in academic settings (Bandura, 1997; Weitlauf et al., 2001). This is a topic, the transfer of learning out of the program and back into the home context (Allison, 2005), that deserves further attention. Although a common assumption is outcomes decrease after a short-term, high-impact experience, Hattie et al.'s (1997) meta-analysis indicated some programs produced outcomes that exhibited post-program growth. More recent research findings suggest post-program outcome growth may be linked to the degree to which participants engage in post-program reflection about the experience (Duerden, Witt, & Taniguchi, 2012).

In order to strengthen the claim that adventure recreation programs can promote the generalizability of outcomes across unrelated domains, future longitudinal research is needed to make stronger causal claims in this area. While some research has attempted to address this call (e.g., Driver, 1984; Ross & Driver, 1986), more work is needed in this area. In addition, the

learning processes associated with this adventure recreation program could moderate learning loss experienced during the summer (Cooper et al., 1996). Program participants engaged in the processes of memorizing, comprehension, synthesis and application of information to make practical decisions.

As indicated earlier, field staff in adventure recreation programs, are with the participants 24 hours a day, seven days a week. Clearly, field guides play a key role in the learning and developmental processes involved with adventure recreation programs. This study demonstrates targeted outcomes can be achieved by training field staff to implement theory based programming and structuring activities to promote efficacy enhancement.

Limitations

A number of limitations are associated with this study. First, due to lack of random sampling, caution should be exercised when generalizing these findings to groups dissimilar to the study's participants. Additionally, self-selection bias is a potential concern considering the recruitment method employed for both the participant and comparison groups. As stated in the methods section, the study employed a nonequivalent comparison group (Babbie, 2005) rather than a true control group. While efforts were made to draw the comparison group from a similar population as the participant group (e.g., age, geographic area, etc.), the two groups did exhibit some differences (e.g., across some of the baseline measures). Due to privacy regulations within the public school system, our ability to establish an equivalent comparison group was limited. At the same time, the focus of the analysis was on investigating change differences across the group rather than equivalency at baseline.

Second, the study employed previously untested measures of outdoor recreation and academic self-efficacy. As indicated by Bandura (2006),

> There is no all-purpose measure of perceived self-efficacy. The "one-measure-fits-all" approach usually has limited explanatory and predictive value because most of the items in an all-purpose test may have little or no relevance to the domain of functioning… Scales of perceived self-efficacy must be tailored to the particular domain of functioning that is the object of interest." (pp. 307-308)

For this study, the outdoor recreation instruments were tailored to the particular domain of functioning. Validity issues deal specifically with breaking down the construct in to hierarchical tasks of increasing challenge. The primary issue is appropriately addressing content to represent the task. In this case, experts on the content areas provided guidance on task content. Historically these instruments provide good reliability. For this sample, the outdoor recreation self-efficacy measures produced reliability coefficients above .90. Future research should focus to develop specific measure for this setting and explore the reliability and validity of inferences. The academic measures used in this study were previously untested, but they were obtained through personal communication with Pajares and Schunk (e.g., Pajares & Schunk, 2002; 2005; Schunk & Pajares, 2001), two of the leading academic efficacy experts. For this sample, both measures produced acceptable levels of reliability (.76 to .88).

Third, the current study did not examine the longevity of the impact of the program by tracking variables such as academic performance or conducting follow-up surveys. The population in this study was somewhat transient. Substantial efforts were made to obtain this information and include it in the analysis, but obtaining post study grade transcripts proved fruitless. Future studies might consider design strategies to track grades over time for both treatment and comparison groups. This would provide information regarding the longevity of the program outcomes.

Fourth, while this adventure recreation program appeared efficacious, the efficacy of any program is directly related to its overall quality and fidelity. In this study, although the staff were trained in the chosen theory, we did not measure the consistency of implementation throughout the course of the intervention. While adventure recreation research has traditionally focused primarily on outcomes, program quality and fidelity are receiving increased attention in evaluation related literature (Duerden & Witt, 2012; Tucker & Rheingold, 2010; Yohalem & Wilson-Ahlstrom, 2010). Quality in this context refers to the program's internal characteristics and processes (e.g., staff interactions with participants, theory based programming) and fidelity deals with the degree the program was implemented as originally designed (O'Donnell, 2008). While this study's intervention produced observable outcomes, increased attention to staff training and implementation fidelity would be important to consider in future studies and in practice.

One avenue for improving adventure recreation program fidelity is to develop well-written theory based program plans targeted towards achieving specific outcomes. These program plans may serve as a foundation for this process and provide the needed protocols. These protocols detail how to implement the adventure activity and how to integrate theory based principles to achieve the desired outcomes. In this context, program administrators can train field staff to implement theory based programming. This can be accomplished by providing training for field staff in a number of areas, such as self-efficacy theory, self-determination theory, and coping skills. The role and influence of field staff on participants cannot be overemphasized. This model is one strategy to maximize the impact of these important relationships.

Conclusion

The context of adventure recreation programs involve a number of aspects such as nature, physical and emotional challenge, and prolonged intense interpersonal interactions that can provide powerful, life-changing experiences for people who are struggling. To take full advantage of these programs, researchers and programmers should continue to work towards identifying mechanism and processes that make the use of this context most effective. The results from this study suggest adventure recreation programming may be an effective approach to facilitate the development of positive outcomes with applicability for both out-of-school and academic contexts. In addition, the program featured in the study models the application of theory-based programming in this setting.

Future research may seek to expand our understanding about how do effectively design and deliver outdoor adventure programs to reach specific academic outcomes and potentially moderate summer learning loss. This research may influence a wide range of out-of-school time programs, including camp, educational enrichment, and even wilderness and adventure therapy. Further, this research might also inform the use of outdoor adventure beyond individuals to guide work with families or even organizations.

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