

Bandura Goes Outdoors: Role of Self-Efficacy in the Outdoor Leadership Development Process

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The foci of this study are the benefits of participation in outdoor leadership programs and the factors that contribute to continued participation in outdoor leadership development activities. Study objectives were to a) assess the short- and long-term effects of outdoor leadership programs on self-efficacy and b) propose and evaluate a path model of self-efficacy and continued participation in outdoor leadership development activities. A quasi-experimental design was employed. Major findings include a significant effect of the treatment (i.e., the outdoor programs) on both immediate and long-term self-efficacy. The full path model was not significant. However, a post hoc division of the path model by gender revealed distinct processes for men and women. Implications for further theoretical development based on path analysis and improvements in outdoor education programs are discussed.

Keywords continued participation, feedback, gender, goal attainment, mentoring, outdoor education, outdoor leadership development, path analysis, self-efficacy

This study documents the extent of two outcomes of structured outdoor programs: self-efficacy and continued participation in outdoor leadership development activities. A possible path to these outcomes, as well as their relationship to the outdoor leadership development process, are also assessed.

Structured outdoor programs are those that have a stated purpose and an organized curriculum aimed at providing participants with opportunities to develop outdoor skills, knowledge, and experience. Skills, knowledge, and experience in turn enhance judgment, a prerequisite of effective outdoor leadership (Cain & McAvoy, 1990; Ford & Blanchard, 1985; Fox & McAvoy 1995; Green, 1990). Examples of more renowned outdoor education programs in the United States are Outward Bound, the Wilderness Education Association (WEA), and the National Outdoor Leadership School (NOLS).

One objective of most outdoor programs is to train outdoor leaders. The expectation is that well-trained leaders will then share their knowledge and skills with others, thereby creating a continuous cycle of learning about the outdoor environment and reinforcing the

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importance of protecting and enjoying natural resources (Lupton, 1990). A key question is: do structured outdoor courses induce participants to take the necessary steps to become outdoor leaders? Knowing the primary factors that influence continued participation in outdoor leadership development activities would assist outdoor organizations in their missions and contribute to the research literature.

Research on leadership development in general has been hindered by the ambiguity in definition and hence measurement of leadership (Rosenbach & Taylor, 1989). Klint (1990) indicates that research has provided insights into leadership outcomes of adventure and outdoor experiences, but has done little to clarify the processes by which outcomes are achieved.

Given that outdoor leadership is a long-term, developmental process (Cain & McAvoy, 1990; Ford & Blanchard, 1985; Petzoldt, 1984; Fox & McAvoy, 1995), it is critical to examine antecedents, intervening variables, and their interrelationships over time. To help clarify these interrelationships, path analysis is an appropriate analytical tool (Pedhazur, 1982). The linkages between independent and dependent variables and the overall design of the path model are developed in advance of data gathering. In this study, the path analysis approach is employed to lead to an understanding of the outdoor leadership development process.

We do not measure outdoor leadership per se. Instead, we provide path models of one of its hypothesized mediators (self-efficacy) and one of its precursors (continued participation in outdoor leadership activities). Since competency, efficacy, and judgment are considered important prerequisites for leadership (Cain & McAvoy, 1990; Ford & Blanchard, 1985; Petzoldt, 1984; Green, 1990), the theory of self-efficacy (Bandura, 1977a) holds much promise for understanding the outdoor leadership development process. Mentoring is another critical component of the leadership development process. Mentoring relationships enhance self-confidence and self-identity (Jeruchim & Shapiro, 1992). Furthermore, feedback and goal attainment positively influence both self-efficacy (Bandura, 1977a, 1977b) and mentoring (Jeruchim & Shapiro, 1992). Therefore, self-efficacy is expected to mediate the influence of feedback, goal attainment, and mentoring on continued participation in outdoor leadership development activities. The reasoning is that as self-efficacy in outdoor skills and knowledge increases, so does the probability of continued participation in outdoor experiences.¹ Continued participation is considered to be a precursor of leadership (Cain and McAvoy, 1990; Raiola, 1990; Green, 1990; Schuett, 1993). The more one participates, the more likely the opportunities for leadership growth will avail themselves.

Thus, the relationships among feedback, goal attainment, mentoring, self-efficacy, and continued participation are specified in a hypothetical path model. The path model is tested, results discussed, and respecified models proposed. The literature that supports the hypothetical path model follows.

Literature Review

Leadership and Participation in Outdoor Activities

A number of authors believe that leadership, including outdoor leadership, is a continual process of experiences (March, 1987; Green, 1990; Raiola, 1990; Rosenbach & Taylor,

¹The term "participation" in this study is intended to avoid confusion with the construct of "involvement" used in a body of related literature. McIntyre (1992), Robinson (1992), and Schuett (1993) use the term "enduring involvement" as the degree of permanent attachment to a particular high risk outdoor activity. Schuett (1993) defines enduring involvement as a permanent trait but notes that other investigators have used the term as an affect or a situational state. "Participation" in this study means overt behaviors as opposed to either states or traits.

1989; Swiderski, 1981). To these authors, leadership is a developmental process of experiences in which outcomes are contingent upon personality, situations, and/or behavioral characteristics.

The outdoor leadership literature acknowledges the significance of personality traits and the situational context, as does the general literature on leadership (Fairholm, 1991; Rosenbach & Taylor, 1989; Easley, 1985). However, the outdoor leadership literature places more emphasis on behaviors and developmental skills (i.e., judgment and decision-making), mentoring, and ongoing feedback as valuable components of the leadership development process (Cain, 1985; Priest, 1990; Hunt, 1984; McAvoy, 1980; Petzoldt, 1984).

Both sets of literature support the idea that leadership development is not an end in itself. The degree of leadership development is a function of active participation in a variety of outdoor-related activities such as classes, workshops, personal experiences, reading, leadership responsibilities, and past outdoor-related jobs (Cain & McAvoy, 1990; Ford & Blanchard, 1985; Green, 1990). Active participation in such experiences leads to better judgment—a prerequisite of effective outdoor leadership.

Even though the nature and extent of leadership development after an outdoor course is largely unknown, adventure recreation researchers and practitioners tend to agree that participants who complete an outdoor experience or course with feelings of self-efficacy, competence, and skill enhancement are more inclined to continue their participation in some form of outdoor recreation (Ewert, 1989). Although Ewert (1989) does not make reference to leadership, the inference is that continued participation in outdoor recreation leads the individual to develop leadership abilities that may be put to use at some future date.

Thus, in addition to continued participation in outdoor-related activities, the literature points to four key factors that should help clarify the outdoor leadership development process. Self-efficacy is one construct used widely across many disciplines to understand individual success and future development. Due to their moderating effects on self-efficacy, other key components of the process are feedback, goal attainment, and mentoring.

Self-Efficacy

According to Bandura (1977a), self-efficacy refers to personal judgments of one's capability to act in specific situations that may contain novel, unpredictable, and potentially stressful encounters. Self-efficacy theory has provided a conceptual framework utilized by many fields to understand behavior and to explain success and/or continued participation in a variety of domains. Behavioral domains investigated include achievement (Collins, 1982; Schunk, 1984), high-risk sports (Brody, Hatfield, & Spalding, 1988), career development (Hackett & Betz, 1981), pain tolerance (Litt, 1988), physical education and sports (Feltz, 1982; Feltz & Mugno, 1983; McAuley & Gill, 1983), adjustment to abortion (Major et al., 1990), and leisure socialization (Hoff & Ellis, 1992). These studies have revealed that self-efficacy has a positive impact on individual success, confidence, and future development. Bandura (1977a, 1986) based perceived efficacy levels on four principal sources of information: performance attainment, vicarious experiences, physiological states, and verbal persuasion. Performance attainments provide the most influential information on efficacy strength (McGowan, 1986). In essence, successes in skills increase efficacy judgments, and repeated failures lower them. It is important to attain success early in order to build strong self-efficacy. Occasional failures after a successful performance are unlikely to have an effect on judgment of one's capabilities (Bandura, 1986).

Self-efficacy can also be increased by vicariously experiencing the modeling behaviors and performances of others. For example, in an outdoor course, each student has the opportunity to view other students performing a task. Each student also takes mental notes

of how instructors are behaving, performing, and interacting with the group and the natural environment. According to self-efficacy theory, the observer makes judgments of her/his efficacy based on the observed performances and behaviors of others. In this situation, peers as well as instructors may act as significant models in influencing student self-efficacy. Support for the influence of such vicarious experiences was provided in a study by Weinberg, Grove, and Jackson (1992), in which modeling through coaching contributed positively to increased self-efficacy.

Individuals tend to rely on information from past performance to judge their emotional and physiological capabilities (i.e., physical stamina) to cope with stressful events. A common finding in psychological functioning research is that of an inverted u-shaped relationship between anxiety and task performance. Up to a certain point, anxiety enhances performance (Evans & Cohen, 1987). For example, Feltz and Mugno (1983) found that anxiety enhances both self-efficacy and performance in a back-diving competition. However, if the task generates too much fear or anxiety and the challenges are beyond one's physical or mental capabilities, then people tend to arouse themselves to levels of distress that debilitate their future actions (Bunting, Little, Tolson, & Jessup, 1986; Ulrich, Dimberg, & Driver, 1991). Experiences and tasks that eliminate debilitating anxiety from a subjective state of perceived risks can heighten self-efficacy and improve performance (Bandura, 1986; McGowan, 1986).

Verbal persuasion may be used to convince people that they have the skills and strength to accomplish their goals. Verbal feedback is one technique used to strengthen efficacy when the desired outcome is achieved. Other verbal techniques that are effective in strengthening self-efficacy include positive self-talk and the use of instruction and drills (Weinberg et al., 1992). Vicarious experiences and verbal persuasion interact and do not always enhance self-efficacy. People tend to trust evaluations and feedback from those who are skilled in the activity (i.e., instructor, coach, teacher, excellent students). However, when the feedback is given without background knowledge and insight into a student's ability to actually succeed at a task, it is likely to create self-doubt, in addition to decreased trust in the one who is providing the feedback (Bandura, 1986; McGowan, 1986). Therefore, it is important to provide accurate, immediate, and specific feedback in order for desired performance to take place (Rink, 1985).

Feedback

Feedback can significantly enhance self-efficacy, particularly in situations where students are unable to judge their own performance (Bandura, 1986). Petruzzello (1986) found that positive feedback gave subjects a positive judgment of their performance. Lenny (1977) reported that when feedback was immediate, objective, and accurate, gender differences in self-confidence were not likely to occur. However, when minimal or ambiguous feedback was given, females reported lower self-confidence than males (Lenny, 1977).

Goal Attainment

According to Bandura and Schunk (1981), pursuing proximal goals and achieving them develops a sense of self-efficacy and increases motivation. Explicit goals are more likely than vague intentions to influence engagement in any given activity. If the goal is deemed to be challenging, and the individual is successful at accomplishing the goal, it is likely that she/he will continue in the activity. Bandura (1986) states that a sense of mastering challenges and accomplishing goals is likely to generate greater interest in the activity. Therefore, achieving goals enhances self-efficacy (Bandura, 1977a, 1977b).

Mentoring

In addition to feedback and goal attainment, mentoring can enhance self-efficacy. A mentoring relationship consists of two persons: a mentor and a protégé. According to Bolton (1980), a mentor is a person who personalizes the modeling influences for the protégé by a type of direct involvement not necessarily provided by a role model. A person can be a role model without being a mentor (Jeruchim & Shapiro, 1992). A role model is one who exhibits behaviors, values, professionalism, and competence that a protégé looks up to and admires (Jeruchim & Shapiro, 1992). In many cases of role modeling, no personal relationship develops. In addition to being a role model, the mentor acts as a guide, protector, coach, friend, sponsor, and teacher (Jeruchim & Shapiro, 1992). In outdoor education programs, a successful mentoring process can be defined as establishing a rapport between student and instructor, encouraging the establishment of goals, offering guidance on continued performance, and providing periodic feedback. According to Redmond (1990), the most important element to the mentoring process is the interaction between the mentor and protégé, or, in this study, the instructor and the student.

There is some evidence of the importance of gender in the mentoring process. For example, female mentors have been found to enhance women's success in career development (Bolton, 1980; Ragins & McFarlin, 1990) and in academia and business (Bahniuk et al., 1990; Luna & Cullen, 1990). The extent to which mentoring affects self-efficacy differentially for males and females are not clear from the literature. However, gender should not be excluded as an important variable in understanding differences in self-efficacy in situations like structured outdoor leadership programs, where there is often a close and long-term relationship between student and instructor.

Proposed Path Model

In keeping with path analysis convention, the hypothesized linkages among variables were formulated, *a priori*, from the leadership literature and self-efficacy theory (Figure 1). The literature indicates that mentoring, goal attainment, and feedback have a positive influence on self-efficacy. Furthermore, a heightened level of self-efficacy is noted as having a positive influence on continued participation in outdoor leadership development activities. Since leadership is dynamic and is influenced by the situation and environment (Fairholm, 1991),

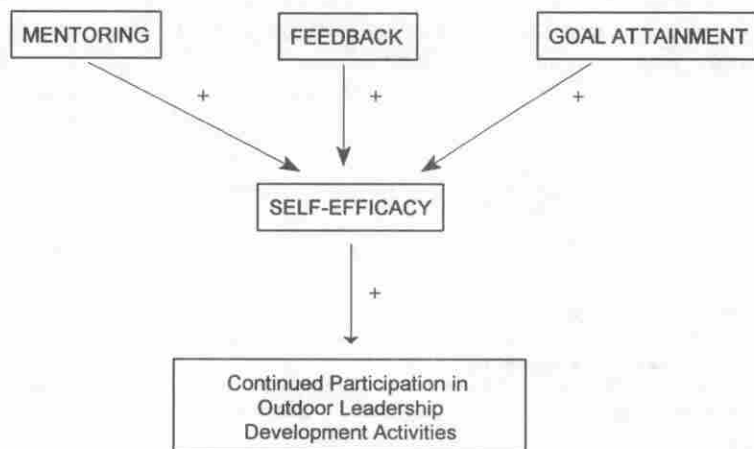


FIGURE 1 Path model of continued participation in outdoor leadership development activities.

and since continued participation develops the judgment necessary for leadership to occur, self-efficacy and its determinants may be the forces underlying the process toward leadership development.

Research Questions

The following questions guided this research:

1. Does self-efficacy increase immediately after the completion of a outdoor course? (For example, what are the short-term effects of an outdoor course?)
2. Does the increase in self-efficacy persist over time? (For example, what are the long-term effects of an outdoor course?)
3. Are there differences between female and male self-efficacy scores? Since feedback and mentoring influence self-efficacy and since gender effects have been identified in the feedback and mentoring literature, gender differences in self-efficacy may exist.
4. What are the relative sizes of the effects of feedback, goal attainment, and mentoring on self-efficacy immediately after the course?
5. Is there a positive, long-term relationship between self-efficacy and continued participation in outdoor leadership development activities? If so, how strong is the relationship?

To assess the short-term, long-term, and gender efficacy and continued participation, separate path analyses were performed for the experimental groups (research questions 4 and 5). Path analysis, a form of multiple regression analysis, yields beta weights ("path coefficients"), which denote the strength of relationships among variables (Pedhazur, 1982). Path analysis was used in this study to examine the extent to which the data fit the hypothesized model depicted in Figure 1.

Method

A variation of the quasi-experimental, "untreated control group design with pretest and posttest" (Cook & Campbell, 1979) was chosen for this study (Figure 2). This design was chosen due to its ability to permit causal inference and the ruling out of more threats to internal validity than would be the case for a "one-group pretest-posttest design" (Cook & Campbell, 1979). There were two variations from the design described by Cook and Campbell. First, the design of this study included a second posttest one year after the first posttest in order to examine long-term effects of the treatment. Second, the control group was measured only once, at the beginning of the study instead of throughout the study

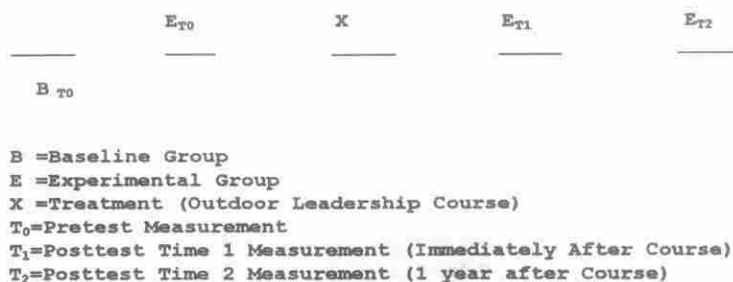


FIGURE 2 Research design (quasi-experimental, untreated baseline group with pretest and two posttests).

TABLE 1 Sample Sizes of Baseline and Experimental Groups in 1992 and 1993

Year	Baseline	Pretest	Posttest time 1	Posttest time 2
1992	n = 30	n = 86	n = 85	n = 66
1993	n = 56	n = 145	n = 109	
Total	n = 86	n = 231	n = 194	Response rate 78% (66/85)

period, and thus is not a control group in the true sense of the word. However, the "control" group permits a clearer interpretation of the effects of the treatment than not having such a group. In effect, the "control" group provides a baseline for comparison purposes and hence will be referred to as the "baseline" group.²

Baseline and Experimental Groups

Subjects included current and potential NOLS students during the summers of 1992 and 1993 (see Table 1). The untreated baseline group ($n = 86$) consisted of a selection of students from outdoor educator's courses, wilderness courses, and mountaineering courses who were scheduled to participate in a NOLS course later that summer. The purpose of the baseline group was to reduce rival, plausible explanations about the timing and location effects of the treatment. For example, Koepke (1973) reported that just before the start of a wilderness course, students experience a high anxiety level that may create a bias in the pretest measures. The baseline group was separated both in time and space from the treatment.

The experimental group initially consisted of 231 students (1992 and 1993 samples combined) already in Wyoming waiting to depart for a NOLS course. The posttest time 1 group, students who had just completed their NOLS course, decreased from 231 to 194 participants (1992 and 1993 combined samples). Due to an evacuation, there was only one "dropout" in 1992. In 1993, however, an unusually high number of evacuations, coupled with one course not receiving a posttest time 1 survey, resulted in a drop in sample size from 145 to 109. Funding limitations imposed by the ending date of the research grant prevented a posttest time 2 survey in 1993. The posttest time 2 group (1992 sample only) was surveyed one year after its course in 1992 and decreased from 85 to 66 participants. These 66 participants constitute a cohort of the same individuals that were compared to each other across three points in time. In addition, these 66 individuals were compared to those who "dropped out" to see if differences existed across key variables.

²The baseline and pretest groups consisted of different individuals, but comparisons between these two groups are valid for two reasons. First, the two groups are very similar demographically (Table 2). Second, the baseline group consisted of individuals who had already registered to take a NOLS course in the summer of the year in which they were surveyed. Thus, one of the tenets of quasi-experimentation, that "control" and treatment groups be composed of subjects with similar characteristics (Cook & Campbell, 1979), has been followed. Furthermore, to rule out history effects, the baseline group should have been administered the posttest instrument. However, it was known that a high portion of those registered (i.e., the baseline group) subsequently complete their NOLS course in the same year that they are registered. Thus, a follow-up survey of the baseline group was not appropriate since most of these subjects would have been exposed to the treatment.

Operational Definitions

Continued Participation

Continued participation in certain outdoor-related activities is used as a measure of progression toward outdoor leadership development. For reasons noted in the literature review, the opportunities for leadership in a particular domain are enhanced as individuals improve their skills and continue their associations with organizations and people who share similar interests. Knowledge, skills, or experience by themselves are insufficient but a balance of all three leads to the development of judgment—a key component of outdoor leadership (Cain & McAvoy, 1990; Petzoldt, 1984). “Knowledge-based activities” were defined as subscriptions to outdoor/environmental magazines, attending relevant workshops and/or conferences, and memberships in outdoor/environmental organizations. “Skill-related activities” were defined as any of the outdoor skills that students were exposed to during their NOLS course (e.g., backpacking, fishing, rock climbing, map and compass, camping, mountaineering) or additional outdoor skills such as canoeing, skiing, and mountain biking. “Leadership-based activities” were defined as planning and/or executing an outdoor trip (e.g., with family, friends, or outside groups), developing an outdoor education program, or possessing a career or job (volunteer or paid, full or part-time) related to outdoor and wilderness education.

Five instrument questions assessed the extent of continued participation. These questions assessed whether or not subjects subscribed to outdoor magazines or journals, attended conferences or workshops, belonged to outdoor organizations, participated in outdoor recreation activities, and led groups on outdoor trips. Each question was coded dichotomously and a composite (summation) was computed. The higher the composite score, the greater the level of continued participation.

Feedback

Feedback was defined as a verbal or written report on the result of any behavior that may reinforce or modify subsequent behavior. Feedback was measured on an ordinal scale in terms of both frequency and type (i.e., direct or indirect). Direct feedback was defined as direct, planned, formal one-way communication from instructor to student. Indirect feedback was defined as one-way communication given by instructors to students in a casual, informal, unplanned manner. Each type of feedback was assessed by two survey items: (1) did you receive (direct or indirect) feedback (yes or no) and (2) how much (direct or indirect) feedback did you receive (ordinal measure: 1–5 times, 6–10 times, 11 or more times). Positive and immediate verbal feedback was also measured, each with a 4-point scale item. For positive feedback, subjects were asked if the verbal feedback they received was mostly positive, somewhat positive, somewhat negative, or mostly negative. For immediate feedback, subjects were asked if the verbal feedback they received was mostly immediate, somewhat immediate, somewhat delayed, or mostly delayed.

Goal Attainment

In the pretest, subjects were asked to identify three goals. After the course, they were asked whether or not they had attained these goals. Goal attainment was an ordinal measure (3 = all three goals were attained, 2 = two of the three goals were attained, 1 = one goal was attained, and 0 = none of the goals were attained).

Mentoring

The mentor teaches, guides, sponsors, advises, coaches, supports, and promotes the protégé (Jeruchim & Shapiro, 1992). Six instrument questions assessed the extent of a mentoring relationship. One question dealt with whether any of the instructors were identified as a role model. Another pertained to whether or not the student confided in an instructor, and a third asked if there was one instructor who provided guidance throughout the course. Three other questions asked about friendship, trust and encouragement. Each question was coded as a dichotomous variable and a composite (summation) was computed. A "yes" to all six items signified a strong mentoring relationship. A "yes" to some subset of these questions indicated a "developing" mentoring relationship.

Self-Efficacy

The measure of self-efficacy was modeled after Bandura's (1977a) format. The self-efficacy scale included 20 items, all of which were organized by tasks of graduated difficulty and commonly included in a outdoor course (Figure 3). Consistent with Bandura's theory, self-efficacy *levels* and *strengths* were measured. "Level" was measured by totaling the number of tasks that the students said they could perform with some confidence. For example, those students who identified 10 items that they felt they could perform with some confidence (greater than 0%) received an efficacy level score of 10. Efficacy "strength" judgments were obtained by asking the subjects on a percentage scale from 10% to 100% how certain or confident they were in achieving the particular task. Higher percentages represent greater self-efficacy strength (McAuley & Gill, 1983). The mean reliability (Cronbach's alpha) of the self-efficacy scale among all four testing groups was 0.91.

Survey Instruments and Administration

The common element in the instrument administered to baseline and experimental groups was the self-efficacy scale. In addition to the self-efficacy scale, variations in the survey instrument were designed to capture information unique to the group being tested. The pretest survey was designed to collect sociodemographic information from students and to have them identify three goals they wished to accomplish on their NOLS course. The posttest time 1 survey was designed to measure each of the factors in the research questions (goal attainment, feedback, and mentoring). The posttest time 2 survey was designed to determine the nature and degree of participation in outdoor education activities one year after a student's course.

To account for uncontrollable effects, such as precourse anxiety (Koepke, 1973), the instrument was administered by mail to the untreated baseline group of registered students before they arrived in Wyoming. Baseline group results were then compared to those of the pretest group. Surveys were administered to the pretest group immediately before students departed on their courses and to the posttest time 1 group immediately after they returned. During these two stages, the investigator was available to give instructions and answer questions.

The posttest time 2 survey instrument was mailed to students one year after their NOLS course. Dillman's (1978) Total Design Method was used in the follow-up survey with a few modifications. With each of the three mailings, a survey was sent along with a letter reminding the student of the purpose of the study and the importance of completing the survey. The total sample size of the posttest time 1 group was 194, a figure that combines samples of 85 and 109 students from the two separate summer sampling periods. For reasons

INSTRUCTIONS: Please indicate how confident you are in your present (today) ability to perform the following tasks. If you have no confidence about the tasks place an "X" in the 0% box. Otherwise, place an "X" in the box that reflects the most appropriate percentage of confidence.

TASKS	Very Uncertain				Somewhat Certain				Very Certain			
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	
17a. CASTING A FISHING LINE												
17b. RAPPELLING OFF OF A ROCK FACE												
17c. STREAM CROSSING OVER FAST MOVING WATER												
17d. USING AN ICE AXE TO PROTECT YOURSELF FROM FALLING ON SNOW/ICE												
17e. CLIMBING A BEGINNER LEVEL CLIMB												
17f. BACKPACK 3 MILES WITH 60lbs. ON YOUR BACK												
17g. CLIMBING AN INTERMEDIATE LEVEL CLIMB												
17h. BACKPACK 6 MILES WITH 60lbs. ON YOUR BACK												
17i. CLIMB A PEAK THAT IS OVER 12,000 FT. IN ELEVATION												
17j. CLIMB A PEAK THAT IS OVER 18,000 FT. IN ELEVATION												
17k. IDENTIFYING FLORA AND FAUNA IN A WILDERNESS AREA												
17l. OUTDOOR COOKING												
17m. IDENTIFYING WEATHER PATTERNS												
17n. ADMINISTERING BASIC FIRST AID												
17o. PRACTICING MINIMUM IMPACT CAMPING AND RESOURCE/ ENVIRONMENTAL PROTECTION												
17p. READING AND INTERPRETING A TOPOGRAPHICAL MAP												
17q. JUDGE THE TIME AND DISTANCE IT MAY TAKE TO HIKE FROM POINT A TO POINT B IN A WILDERNESS SETTING												
17r. ROUTE FINDING OFF TRAIL IN A WILDERNESS SETTING												
17s. LEADING A SMALL (3-5) GROUP IN A WILDERNESS SETTING												
17t. ORGANIZING AN EMERGENCY EVACUATION PROCEDURE												

FIGURE 3 Self-efficacy scale of wilderness skills.

stated earlier, only the 1992 Summer sample of 85 was mailed the posttest time 2 instrument. The response rate for the Summer 1992, posttest time 2 group was 78% (Table 1).

Results

There were only minor variations in demographic characteristics between baseline and experimental groups (Table 2).³ For example, females slightly outnumbered males in both groups (53% and 56%, respectively). Furthermore, the average age of baseline and

³A similar analysis (not shown) compared year-one and year-two groups in terms of age, gender, education, employment, course type, and experience level. No statistically significant differences were found.

TABLE 2 Demographic Characteristics of Baseline and Experimental Group Respondents

Survey items	Baseline group (n = 86)	PCT.	Experimental group (n = 231)	PCT.
Gender				
Female	40	47%	102	44%
Male	45	53%	129	56%
		100%		100%
Age range	16–38 yrs.		15–51 yrs.	
Average age	24 yrs.		22 yrs.	
Education completed ^a				
Elementary sch.	0	0%	1	1%
Junior high	18	21%	60	26%
Senior high	29	34%	88	38%
Associate and B.S.	26	31%	56	23%
Graduate	12	14%	26	12%
		100%		100%
Exper. level ^b				
Introductory	11	13%	33	14%
Development	62	73%	177	77%
Commitment	12	14%	20	9%
		100%		100%

^aThe total number of full-time students were 56 in the baseline group and 155 in pretest group.

^bIntroductory: Participants have little or no experience with outdoor adventure activities.

Developmental: Participants have some previous experience in outdoor adventure activities.

Commitment: Participants have high level skills, experience, and commitment to outdoor adventure activities.

experimental participants was 24 and 22, respectively. There was some variation in education level between the two groups with a higher percentage (45%) of the baseline group completing a college degree than the experimental group (35%). Thirteen percent of participants in the baseline group and 14% in the experimental group indicated having little or no outdoor experience prior to coming to NOLS. Thus, a high percentage of both groups had some previous outdoor experience before attending NOLS.

Short- and Long-Term Effects

Based on the combined data across both years, the pattern in Figure 4 demonstrates the positive short- and long-term effects of NOLS courses on self-efficacy. The posttest time 1 self-efficacy strength score was significantly higher than the self-efficacy strength scores of the baseline ($t = 12.638$; $p = .000$) or the pretest groups ($t = 23.427$; $p = .000$). Baseline group self-efficacy exceeded pretest group self-efficacy (53% vs. 48%, respectively) and this difference was also statistically significant ($t = 2.512$; $p = .013$). This finding is consistent with Koepke (1973) who found evidence of an anxiety bias immediately before a student departs for the field. Participants may feel more anxious and therefore less competent when the challenging task they are about to endure is imminent as opposed to a month in the future.

In the long-term (one year after treatment), self-efficacy strength diminished. Compared to the posttest time 1 score of 82%, the posttest time 2 score of 76% was significantly lower

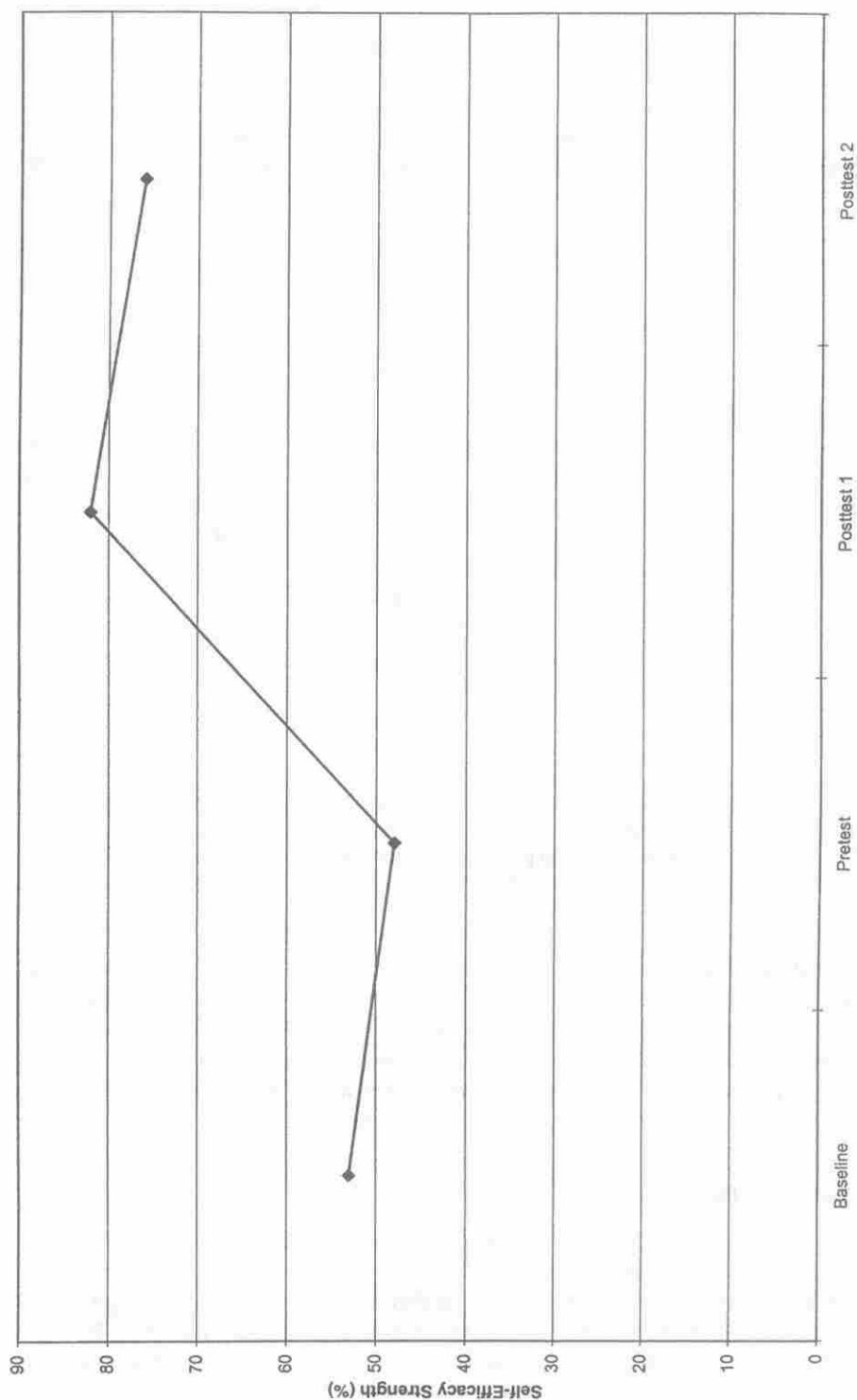


FIGURE 4 Self-efficacy strength for full sample (both years combined).

(independent $t = -3.506$; $p = .001$; paired $t = -4.112$; $p = .000$). However, paired t -tests revealed no significant differences in self-efficacy in 10 out of the 20 outdoor tasks over a year's time. Furthermore, the posttest time 2 mean of 76% was significantly higher than the baseline group of 53% (independent $t = 8.640$; $p = .000$) and the pretest group of 48% (paired $t = 9.813$; $p = .000$). Thus, there was a significant effect of the NOLS course on the experimental group and this effect continued to be statistically significant one year after the treatment.

A repeated designs analysis (MANOVA) was conducted to assess whether the same patterns would hold for just the repeated subjects. In comparing the same 66 individuals who were administered the pretest, posttest time 1 and posttest time 2 instruments in year 1, the effect of the treatment was significant ($F = 81.302$; $p = .000$). Furthermore, the magnitude of the effect was similar to the full sample (Figure 5). Thus, the results of the repeated designs analysis were consistent with those of the full sample analysis.

Another analysis comparing the 66 repeated subjects to the remainder of the sample in years 1 and 2 was also conducted. As illustrated by the pattern in Figure 5,⁴ there were no significant self-efficacy differences between repeated subjects and all remaining subjects in either the pretest ($t = 2.12$; $p = .147$) or the immediate posttest ($t = 1.797$; $p = .075$). Therefore, the overall significance in the full sample is not masking nonsignificant results in either repeated or nonrepeated groupings of subjects.

Gender and Self-Efficacy

There was no significant self-efficacy difference between males and females in the baseline (Table 3). In the pretest, independent t -tests revealed that male self-efficacy scores were significantly higher in 15 out of 20 outdoor tasks and higher in all tasks combined compared to females ($t = 8.821$; $p = .000$). Despite the difference at the pretest level, female self-efficacy scores caught up to those of the males by the end of the course. Furthermore, there were no significant differences one year later (Table 3).

Path Model Correlations

A correlation matrix (Table 4) was developed to examine the pattern of associations among the hypothesized path model variables (Norusis, 1988; Miller, 1991). Three of the four exogenous variables (positive feedback, immediate feedback, and mentoring) were significantly correlated with short-term self-efficacy as hypothesized. The fourth, goal attainment, was positively correlated but not significant. None of the four exogenous variables had any association with long-term self-efficacy (SE2). In fact, the correlations were all negative.⁵ This means that factors other than those assessed in this study are related to self-efficacy (SE1) in the long run.

⁴ As there was no significant difference in self-efficacy between year 1 and year 2 baseline groups (56% vs. 52%, respectively; $t = .902$; $p = .370$), the overall mean of 53% was used as a starting point in Figure 5.

⁵ The only measures of long-term self-efficacy and continued participation occurred one year after the summer 1992 data collection period and are, therefore, based on a sample of 66 (Table 1). The remaining five variables and corresponding correlations in Table 4 are based on data collected only in the summer of 1993 ($n = 109$ in Table 1). This is because the items measuring feedback and mentoring during the summer of 1992 were found to be unreliable and were subsequently modified in the summer 1993 instrument (Koesler, 1994). Thus, the correlations in the bottom two rows of Table 4 are between variables measured with different subsamples. It is felt that these correlations are appropriate because of (a) the similarities between the summer 1992 and 1993 subsamples (Koesler, 1994) and (b) the finding of no significant differences in self-efficacy between years and subsamples (Figure 5 and related discussion).

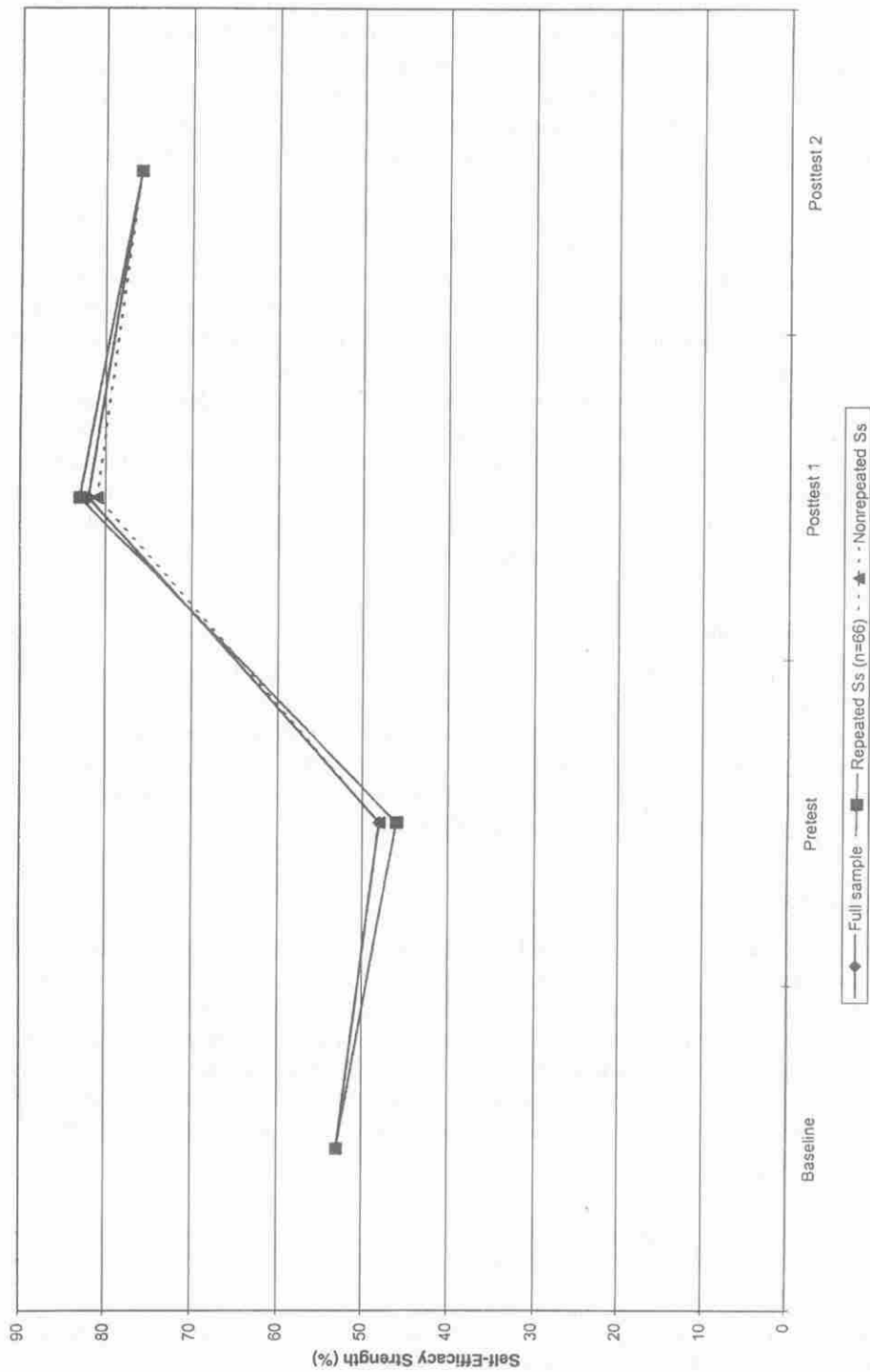


FIGURE 5 Self-efficacy strength for full sample vs. repeated subjects ($n = 66$) vs. all remaining subjects.

TABLE 3 Comparisons Between Female and Male Self-Efficacy Scores in Baseline and Experimental Groups

Gender	Baseline group (n = 86) (F = 39, M = 45)			Pretest group (n = 231) (F = 102, M = 129)			Posttest time 1 group (n = 194) ^a (F = 89, M = 105)			Posttest time 2 ^a group (n = 66) ^b (F = 35, M = 31)		
	$\bar{X}$	SD	P-value	$\bar{X}$	SD	P-value	$\bar{X}$	SD	P-value	$\bar{X}$	SD	P-value
Female	55%	19.51		41%	18.12		82%	9.73		75%	12.43	
Male	51%	18.93	.295	53%	18.16	.000	82%	9.11	.813	76%	12.02	.921

F = Females M = Males.

SD = Standard deviation.

^aDecrease in sample size from pretest to posttest 1 due to high number of evacuations during summer and 1992 and one course not receiving a survey upon completion of outing.

^bOnly year 1 subjects were contacted one year after their course (85 year 1 subjects contacted; 66 returned survey instrument). Grant ending date prevented survey of second year subjects one year after their course.

TABLE 4 Zero-Order Correlation Matrix of Hypothesized Path Model

	Variable	GA	PF	IF	M	SE1	SE2	CP
GA	Goal attainment ^a							
PF	Positive feedback ^a	-.061						
IF	Immed. feedback ^a	-.034	.376***					
M	Mentoring ^a	.213*	.151	.048				
SE1	Short-term self-efficacy ^a	.135	.182*	.155*	.232***			
SE2	Long-term self-efficacy ^b	-.100	-.086	-.012	-.003	.106		
CP	Cont'd. participation ^b	-.001	-.126	-.017	.055	.134	.272**	

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a $n = 109$ summer 1993 Ss only (47 females, 62 males); summer 1992 Ss not included because items measuring feedback and mentoring were found to be unreliable and were changed in summer 1993 to reduce confusion (Koesler, 1994).

^b $n = 66$ subjects one year after their summer 1992 NOLS course (31 females, 35 males); funding limitations imposed by the ending date of the research grant prevented a second posttest of the summer 1993 sample.

Reading across the bottom row of Table 4, only long-term self-efficacy was significantly correlated with continued participation in outdoor leadership development activities ($r = .272$). The correlation between short-term self-efficacy and continued participation was in the predicted direction but was not significant ($r = .134$).

Correlations based on gender (not shown) display a pattern similar to that of Table 4, with a few key exceptions. For males, the only exogenous variable significantly correlated with short-term self-efficacy was immediate feedback ($r = .202$; $p = .048$). No variables were significantly correlated with continued participation. For females, however, goal attainment ($r = .315$; $p = .019$), mentoring ($r = .464$; $p = .001$), and positive feedback ($r = .317$; $p = .015$) were significantly correlated with short-term self-efficacy. In addition, while short-term self-efficacy and continued participation for females were negatively correlated ($r = -.295$; $p = .054$), long-term self-efficacy and continued participation were positively and significantly correlated ($r = .427$; $p = .008$).

Path Analysis

Path coefficients for five structural equations were derived. First, path coefficients were computed for the two structural equations that represent Figure 1:

$$\text{short-term SE} = x_1\text{GA} + x_2\text{PF} + x_3\text{IF} + x_4\text{M} + e_1, \quad (1)$$

$$\text{CP} = x_5\text{short-term SE} + e_2, \quad (2)$$

where SE = self-efficacy, GA = goal attainment, PF = positive feedback, IF = immediate feedback,⁶ M = mentoring, and CP = continued participation in outdoor leadership activities.

Next, to test for the existence of a reciprocal relationship between self-efficacy and continued participation, the path coefficient for a third structural equation was computed:

$$\text{CP} = x_6\text{long-term SE} + e_3. \quad (3)$$

⁶Direct and indirect feedback were dropped from path analyses because of negligible correlations with self-efficacy (Koesler, 1994).

To examine the direct and indirect effects of both exogenous and endogenous variables (Alwin & Hauser, 1981; Bryman & Cramer, 1994; Miller, 1991), path coefficients were derived for

$$CP = x_7GA + x_8PF + x_9IF + x_{10}M + x_{11}\text{short-term SE} + e_4, \quad (4)$$

$$CP = x_{12}GA + x_{13}PF + x_{14}IF + x_{15}M + x_{16}\text{short-term SE} \\ + x_{17}\text{long-term SE} + e_4. \quad (5)$$

Regression equations (1), (4), and (5) are shown in Table 5. The path coefficients for (2) and (3) are the zero-order correlations between continued participation (CP) and short and long-term self-efficacy, respectively (Table 4).

The path coefficients for the full model (equations (1) and (2) are entered in the left half of Figure 6. All path coefficients were in the hypothesized direction (positive), but none were significant. Equation 3 yielded a significant path coefficient between long-term self-efficacy and continued participation ($B = .272$; $p = .027$). Hence, a proposed, respecified model utilizing long-term self-efficacy as another exogenous variable was also tested (5). The results are shown in the bottom-third of Table 5 and the right-half of Figure 6. The path coefficient for long-term self-efficacy and continued participation was again significant ($B = .273$; $p = .040$). The coefficient of determination (R^2) was 0.096, indicating that only 10% of the variance was explained by the independent variables in (5). However, adding long-term self-efficacy as an independent variable increased the amount of variance explained four-fold over (4), which included only short-term self-efficacy ($R^2 = 10\%$ vs. 2.5%, respectively).

Despite the low amount of variance explained by the path model for the full sample, there was evidence of a reciprocal relationship between self-efficacy and continued participation. Self-efficacy immediately after the NOLS course had a positive but nonsignificant impact on continued participation ($B = .134$; $p = .141$). Continued participation and self-efficacy one year later were positively and significantly related ($B = .272$; $p = .027$). However, it is not clear if long-term self-efficacy influenced continued participation or vice versa. When entered as a regressor (5), long-term self-efficacy made a significant contribution ($B = .273$; $p = .040$) and this is the direction specified by self-efficacy theory. Nonetheless, it is just as likely that continued participation influenced long-term self-efficacy. Thus, the link between them is indicated by a curved arrow with two heads (Bryman & Cramer, 1994). The path coefficient ($B = .272$; $p = .008$) is the Pearson zero-order correlation from Table 4 (Miller, 1991).

Path Model Gender Differences

Due to the influence of mentoring and long-term self-efficacy, the model for females explained over nine times more variance than the full sample model ($R^2 = 23\%$ vs. 2.5%, respectively) and over 14 times more variance than the model for males ($R^2 = 23\%$, vs. 1.6%, respectively). The hypothesized path model for females is shown in the left-half of Figure 7.

Mentoring had a stronger impact than any of the other independent variables on short-term self-efficacy for females ($r = .368$; $p = .014$). None of other three exogenous variables had significant path coefficients. The relationship between short-term self-efficacy and continued participation for women was weak ($r = .013$). However, continued participation in outdoor education activities and self-efficacy one year after the course were significantly related ($r = .498$; $p = .002$). This relationship did not hold for males ($r = .028$).

TABLE 5 Path Coefficients and Structural Equations of a Model of Continued Participation in Outdoor Leadership Development Activities: NOLS Students (1992 and 1993), Lander, Wyoming

Dependent variables	Equations and predetermined path variables						
	Mentoring	Goal attainment	Positive feedback	Immediate feedback	Short-term SE ¹	Long-term SE ¹	R ² F Significance
Short-term SE¹							
Full sample	0.186	0.106	0.121	0.104			0.096 2.511 *
Females	0.368*	0.253	0.245	-0.014			0.327 4.377 **
Males	0.055	0.050	0.018	0.193			0.048 0.681 ns
Continued participation							
Full sample	0.089	-0.022	-0.148	0.040	-0.042		0.025 0.288 ns
Females	0.389*	-0.036	-0.197	0.025	-0.403		0.227 1.408 ns
Males	-0.032	0.041	-0.048	0.007	0.110		0.016 0.089 ns
Continued participation							
Full sample	0.087	0.013	-0.114	0.037	-0.080	0.273*	0.096 0.995 ns
Females	0.272	-0.059	-0.158	-0.038	-0.326	0.342*	0.329 1.876 ns
Males	-0.012	0.068	-0.034	0.024	0.072	0.154	0.037 0.166 ns

SE = self-efficacy.

*p < 0.05; **p < 0.01; ns = not significant.

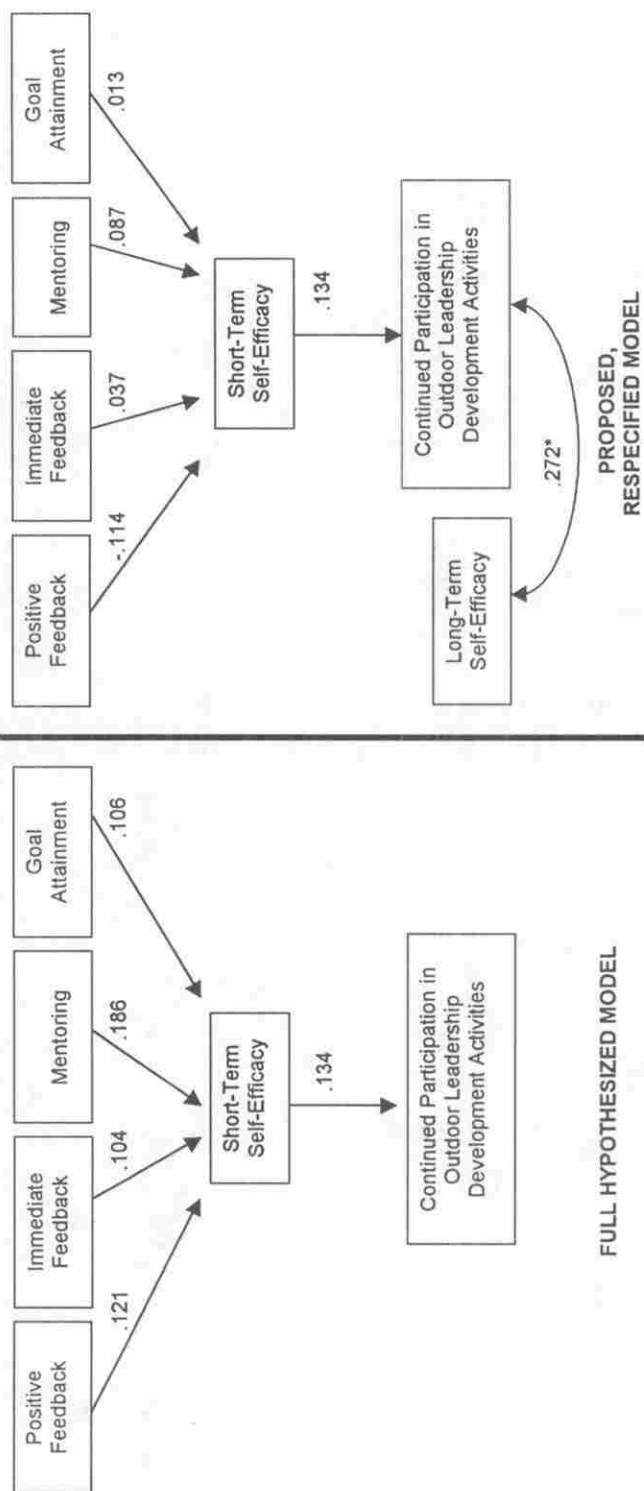


FIGURE 6 Full hypothesized and proposed, respecified models.

*Significance < .05.

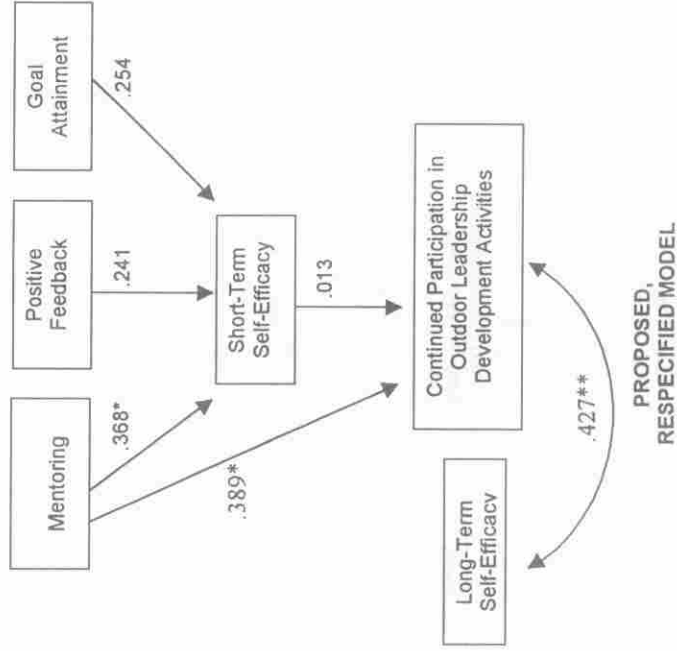
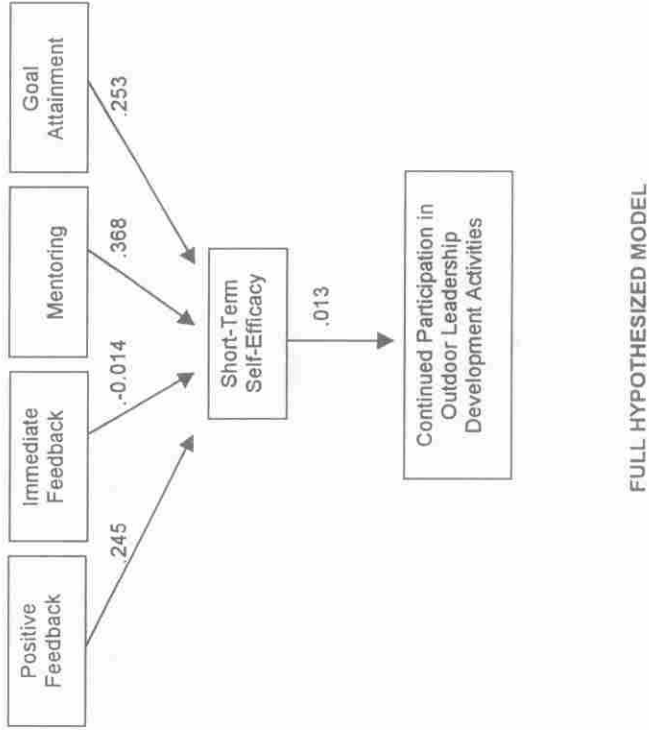


FIGURE 7 Full hypothesized and proposed, respecified path models for females.

*Significance <.05.

**Significance <.01.

Because of the weak association between immediate feedback and short-term self-efficacy ($B = -.014$) and the significant association between long-term self-efficacy and continued participation, a respecified model was computed for females (right-half of Figure 7). The respecified model explained 33% of the variance in continued participation for females (Table 5). The path coefficients in the respecified model reinforce the influence of mentoring and long-term self-efficacy on continued participation. Mentoring had significant influences on both short-term self-efficacy and continued participation by women. As shown in the right-half of Figure 7, almost all of the effect of mentoring on continued participation was due to its direct influence rather than its indirect influence via short-term self-efficacy (Alwin & Hauser, 1981).

As was the case in Figure 6, it was also not possible to specify the causal direction between long-term self-efficacy and continued participation in Figure 7. Thus, a curved, double-headed arrow connects the two variables. The path coefficient ($B = .427$; $p = .008$) is the Pearson zero-order correlation.

The link between short-term self-efficacy and continued participation was very weak for females ($B = .013$). Long-term self-efficacy and mentoring had much stronger influences. The same pattern was not true for males. Though not significant, immediate feedback had the strongest influence on short-term self-efficacy for males ($B = .193$). Furthermore, the link between short-term self-efficacy and continued participation was nearly 20 times stronger for males than females ($B = .254$ vs. $.013$, respectively). This implies a respecified model for males as follows:

immediate feedback → *short-term self-efficacy* → *continued participation*.

Discussion

There was a significant effect of the NOLS courses on self-efficacy. The effect diminished somewhat but remained statistically significant one year later. After the NOLS courses when skills were fresh and the experience not far removed, self-efficacy scores were highest. However, with the passage of time and the potential to be less involved in outdoor activities as compared to a 30-day NOLS course, self-efficacy scores dropped, but not to the level of the pretest and baseline group scores.

The only significant difference between male and female self-efficacy occurred during the pretest (i.e., immediately before departing on the wilderness course). At the onset of the course, male self-efficacy scores were significantly higher than female scores in the aggregate and in 15 out of 20 wilderness tasks. However, these differences disappeared immediately after the course and in the one year follow-up assessment.

Gender differences in coping with novel and stressful situations provide some clues to potential causes of the pretest differences between men and women. Since an anxiety effect has been observed immediately before the onset of a challenging outdoor adventure activity (Koepke, 1973), it may be that men and women are responding differently to the forthcoming event. Women tend to be more intuitive than men about the consequences of their actions (Ferrier, 1992). This strategy may lower their feelings of competence immediately before physically challenging tasks that have been defined socially as male-oriented. On the other hand, males instinctively take less time to intuit their abilities (Ferrier, 1992) and, consequently, become more immediately involved in the task (Appling, 1989). This implies that men devote less time thinking about the consequences than women, become less anxious, and thus perceive little change in efficacy.

In addition to the significant treatment effect, this study indicates that the process leading to continued participation in outdoor education activities is different for women than men.

A notable difference between females and males was seen in their responses to mentoring. While mentoring contributed to improving self-efficacy overall, it was more important to females than to males. Mentoring also had a direct effect on continued participation in outdoor leadership development activities for females. These findings are consistent with the literature indicating that females tend to be less task-oriented than males (Appling, 1989). In other words, females tend to depend on mentoring and positive feedback to enhance self-efficacy and, hence, performance. On the other hand, males are more task-oriented. For males, receiving feedback immediately after their successes (irregardless of the type of feedback) may enhance self-efficacy. These inferences require further study.

Furthermore, long-term self-efficacy (i.e., one year after the course) was significantly related to continued participation for females, but not for males. For females, long-term self-efficacy accounted for most of the variance explained by the respecified path model in Figure 7. It appears that female self-efficacy in the long run sustains continued participation in outdoor leadership development activities. Though not statistically significant, self-efficacy immediately after the course as opposed to a year later was a more important contributor to continued participation for males than females.

This research also revealed that the type of feedback given to students throughout an outdoor course is important in enhancing self-efficacy but not in explaining variations in continued participation in outdoor leadership development. Positive feedback was more important for females and immediate feedback more important for males in raising levels of short-term self-efficacy. Rink (1985) states that if the feedback is delayed beyond the point of remembering the behavior, then individuals do not benefit from that feedback. For men, such a delay may affect short-term self-efficacy more than for women.

Limitations

The "control" group was measured only once, at the beginning of the study. Thus, history and maturation effects cannot be completely ruled out as threats to internal validity. In fact, the control was not really a control in the true sense of the word, because this group was composed of different subjects than the treatment groups. Hence, it is more appropriate to refer to the "control" as a "baseline" group. On the plus side, the baseline group, measured at the onset of the study helped rule out the alternative hypothesis that observed results are independent of the treatment. The baseline measure helped clarify how self-efficacy changed over time and in relation to both the location of the administration of the instrument and the treatment.

Goal attainment was found to have little influence on self-efficacy in the hypothesized model. This result is opposite of the literature (Bandura, 1986) and was due, in part, to measurement error. Since most students stated that they attained their goals during their NOLS course, there was little variation in the measure of goal attainment.

A third limitation is that the results and conclusions cannot be generalized beyond the impact that NOLS courses have on NOLS students. The processes and outcomes may be entirely different as a result of participation in other structured wilderness education courses.

Recommendations for Future Research

Rather than identifying the traits of an outdoor leader, this research was concerned with the "process" toward leadership, operationalized as continued participation in outdoor leadership development activities. The full path model depicted in Figure 1 was found to be nonsignificant. This does not mean that structured outdoor education programs are superfluous. The outdoor courses that served as a treatment in this study significantly enhanced

self-efficacy, an effect that remained statistically significant one year later. Also, when queried one year after their NOLS course, 98% of the subjects said that they would likely participate in adventure activities in the future, and 68% said they would likely pursue a career related to outdoor adventure (Koesler, 1994). In addition, Koesler (1994) conducted oral histories with 19 individuals who had taken a NOLS course from two to five years before the onset of this study. Nine of the 19 former students indicated that NOLS influenced their continued participation in wilderness education activities, but not necessarily as leaders. Therefore, there is a need to study populations of outdoor leaders, not just students who are currently taking courses.

There is also a need to investigate other variables that minimize the error in regression and enhance understanding of the continued participation and leadership processes. For example, while not initially an independent variable in the hypothesized model, gender should be included as an independent variable in future studies of this nature. Moreover, the factors that contribute to long-term self-efficacy were not measured in this study but need to be identified. This is because of the strong relationship between long-term self-efficacy and continued participation for females.

The results of the path analysis were consistent with Bandura's theory of self-efficacy, but only moderately so and more so for females than males. About one-third of the variation in female, short-term self-efficacy was accounted for by the variables in the path model. However, one of the strongest contributors, mentoring, is not directly identified by Bandura and his colleagues as a determinant of self-efficacy. Furthermore, factors other than those addressed in this study affect continued participation by males in outdoor leadership development activities. For example, immediate feedback was more important for males than females in explaining variations in short-term self-efficacy. This immediate feedback may be derived from one's own successes in performing a task rather than from an instructor. Thus, success in task performance may be a more important factor for males than females.

There are several alternative interpretations of gender differences in self-efficacy that will require further research. For example, a differential self-efficacy effect related to the immediacy of the course was observed. The reason for this difference is not clear, though, as previously noted; gender differences in coping with novel or stressful situations may be a key factor which bears further investigation.

Last, future path models need to test the nonrecursive (i.e., two-way) relationship between continued participation and self-efficacy. The results suggest that self-efficacy may not function merely as a means to continued participation but rather may operate in a cyclical manner, whereby continued participation and self-efficacy impact each other in a continuous process.

Implications for Outdoor Leadership Training and Instruction

The results of this study suggest several implications for professionals who are involved in outdoor leadership training and instruction. First, it is recommended that instructors be exposed to training that sensitizes them to the differences between females and males in their development as confident persons and competent outdoor leaders. The provision of workshops and seminars concerned with ways to improve leadership potential for both genders would benefit outdoor leadership organizations and their clients.

A second implication is that providing mentoring relationships will enhance self-efficacy, particularly for women, thus increasing the potential for continued outdoor participation. While NOLS instructors provide some one-on-one guidance and sharing of goals with students, this research points to the need for an increase in these interactions.

Third, instructors and outdoor educators should give immediate and positive feedback to students. Positive feedback was more important for females and immediate feedback more important for males in raising levels of short-term self-efficacy. Both types of feedback are related to self-efficacy, a precursor of continued participation in outdoor leadership development activities, particularly for males.

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