THE PRODUCTIVE SUCCESS AND PRODUCTIVE FAILURE BELIEFS AND PRACTICES OF OUTDOOR EDUCATORS

by

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Table of Contents

List of Tables

List of Figures

Abstract

This study investigated the success and failure beliefs, instructional practices, and personal learning preferences of outdoor adventure education (OAE) instructors, and explored factors that influenced these beliefs, practices, and preferences. While statistical analysis did not show significant differences among the various demographic categories on success beliefs, instructional practices, or personal learning preferences, there were significant differences in the magnitude of reported failure beliefs. Results from this study showed that OAE instructors' age, their professional experience, their employer, and the activities they teach affect their failure beliefs. Furthermore, OAE instructors indicated that success instructional techniques, like implementing scaffolding, should be used at the onset of a course or when a new skill is being introduced, while failure techniques should be employed as students gain experience or as a perception check to assess competence. The implications of these findings for OAE instructors is discussed.

Keywords: outdoor adventure education, outdoor education instruction, productive success, productive failure, teachers' beliefs

The Productive Success and Productive Failure Beliefs and Practices of Outdoor Educators

Since the inception of outdoor adventure education (OAE) courses in the United States in the early 1960s, researchers have closely examined the effects of participation in such courses; however, in the past two decades, research has become more prolific with examinations of both the outcomes (e.g. Furman & Sibthorp, 2014; Goldenberg, McAvoy, & Klenosky, 2005; Hattie, Marsh, Neill, & Richards, 1997; McKenzie, 2000; Overholt & Ewert, 2015; Richmond et al., 2015; Sibthorp et al., 2015) and the mechanisms used to obtain these outcomes (e.g. McKenzie, 2003; Paisley, Furman, Sibthorp, & Gookin, 2008; Schumann, Paisley, Sibthorp, & Gookin, 2009; Sibthorp, Paisley, & Gookin, 2007). While the literature is replete with studies documenting the outcomes of participation in OAE courses, there is currently limited empirical research chronicling the mechanisms or the pedagogical techniques used to obtain these outcomes (Luckner, 1994; Phipps & Claxton, 1997).

In a study conducted in 2008, Paisley, Furman, Sibthorp, and Gookin identified instructor-orientated mechanisms, that is, the techniques, skills, and practices utilized by instructors to realize learning objectives, as one way in which OAE outcomes are achieved. Specific examples of instructor-orientated mechanisms include: one-on-one coaching, facilitating reflections and debriefs, providing feedback, and teaching formal classes. In addition, McKenzie (2003) found that instructors' feedback and expectations were two mechanisms that fostered learning for Outward Bound Western Canada students. Building upon the work of Paisley et al. (2008), Schumann, Paisley, Sibthorp, and Gookin (2009) revealed that instructors were identified by OAE students as a significant mechanism influencing learning and transfer of course curriculum. In a subsequent study, Sibthorp, Furman, Paisley, Gookin, and Schumann (2011) noted that instructors used formal instruction and role modeling to encourage learning transfer in

National Outdoor Leadership School (NOLS) students. While these studies found that OAE instructors influenced student learning, they lack specific evidence highlighting how OAE instructors achieved desired programmatic learning outcomes. That is, these studies do not describe the instructional beliefs, methodologies, or techniques employed by OAE instructors, specifically in regards to their use of success and failure as pedagogical tools.

As Kapur (2008, 2015) noted, there can be hidden value in failure experiences, and they may be productive for developing deeper understanding and ultimately foster learning. Kapur and Bielzczyc (2012) defined productive failure as an instructional methodology that may limit initial performance, and possibly lead to student failure; however, it fosters learning in the long run. On the other end of the spectrum sits productive success which both maximizes performance in the short-term, while maximizing learning in the long-term. When examining theories (e.g. Joplin, 1981; Kolb, 1984) and processes (e.g. Walsh & Golins, 1976) frequently cited to describe teaching and learning in OAE contexts, the role and utilization of failure are not explicitly mentioned. However, two of the largest providers of OAE courses in the United States, NOLS and Outward Bound (OB) both reference failure in their institutional literature. In the *Wilderness Educator Notebook* (2015), the editors noted that the NOLS "experiential education model includes optimal challenges for our students that include options for failure, within sensible boundaries" (p. 27). Furthermore, one of OB's programmatic beliefs is that its students should learn from both success as well as failure (Outward Bound [OB], 2015).

Although there is support for learning through failure at the OAE institutional level, curriculum is delivered by OAE instructors in wilderness classrooms that are far removed from administrators' oversight. As researchers (e.g. Fang, 1996; Pajares, 1992) have noted, instructors' pedagogical beliefs have an enormous impact on their behavior in the classroom.

Since failure is prominently referenced in two of the largest providers of OAE courses in the United States, and research has demonstrated that teachers' beliefs influence instruction, it is imperative that research examines the instructional beliefs and practices of OAE instructors regarding the provision of success and failure in their outdoor classrooms.

Purpose of the Current Study

As Pelchat and Goc Karp (2012) and others (Phipps & Claxton, 1997; Richardson, Kalvaitis, & Delparte, 2014) observed, few studies have been conducted to identify the pedagogical practices used in OAE settings. This study seeks to fill a void in the literature by describing OAE instructors' self-reported beliefs and instructional practices regarding the provision of success and failure in their outdoor classrooms. Utilizing productive success and productive failure as reference points, this study specifically seeks to determine where OAE instructors fall on the productive success/productive failure continuum. Furthermore, it attempts to identify how certain factors (e.g. the activity being instructed) influence the self-reported instructional beliefs and practices of OAE instructors. The outcomes of this study could have implications for OAE providers like NOLS or OB, as well as for OAE instructors in general.

Literature Review

Productive Success

Productive success involves structuring learning and problem-solving activities at the onset of instruction (Kapur, 2011). This structure is believed to both maximize performance and foster learning (Kapur & Bielzczyc, 2012), and is rooted theoretically in Vygotsky's construct of the Zone of Proximal Development (ZPD) (Kapur, 2006; Reiser & Tabak, 2014; Vygotsky, 1978). As Reiser and Tabak (2014) noted, ZPD refers to a set of tasks that are currently outside learners' abilities to perform by themselves. However, with appropriate support, provided by a

more knowledgeable individual, these tasks become achievable. Ultimately, this process expands the range of tasks a learner is able to accomplish individually without support.

In educational contexts, structure is added through the use of various *scaffolds.* Scaffolding enables novices to solve problems or complete tasks that would otherwise be beyond their current abilities (Wood, Bruner, & Ross, 1976). During scaffolded learning, an expert manages components of the task that are currently beyond learners' capabilities. This allows learners to focus their attention on the parts of the task that are manageable and they are able to complete (Wood, Bruner, & Ross, 1976). Wood, Bruner, and Ross (1976) believed that scaffolding enabled learners to develop task competence at a faster rate than would be expected if they were unassisted. As competence is developed, the expert turns over control of the activity to the novice, and the scaffold is faded away (Reiser & Tabak, 2014). Therefore, scaffolding serves two distinct purposes. It facilitates performance of a complex task, while simultaneously enabling learning to occur from the experience (Reiser & Tabak, 2014).

Although the overarching goal of scaffolding is to help learners accomplish and learn from tasks that they otherwise would not be able to complete, how scaffolding is implemented varies depending on the needs of the learners and the specific learning context (Kapur, 2008; Reiser & Tabak, 2014). Quintana et al. (2004) noted that the sense-making, the process, and the articulation and reflection stages of learning could be scaffolded. Scaffolding sense-making ensures learners understand the problem space or supporting data. By scaffolding the process, learners are aided in choosing appropriate strategies and selecting processes that lead to solutions. Finally, scaffolding articulation and reflection provides opportunities for learners to verbalize their thought processes while working through a problem, and then productively reflecting on their solutions. The benefits of scaffolding to learners include: making complex

tasks attainable, managing the processes so that learners are freed to solve authentic problems, controlling frustration which in turn maintains interest and motivation, and directing learners' attention to salient components of a problem (Reiser & Tabak, 2014). As Kapur (2008) noted, these external structures (scaffolds) are provided to foster learning and ultimately reduce the possibility of failure. Moreover, Kirschner, Sweller, and Clark (2006) argued that guided instruction is more efficient, more effective, and leads to fewer student misconceptions.

Productive Failure

A core belief buttressing the productive success approach is that learning experiences should be scaffolded to prevent learners from experiencing failure (Kapur, 2008). On the other hand, Kapur (2008) questioned whether there was hidden value found in failure experiences. He developed and empirically tested the productive failure instructional methodology (Kapur, 2008, 2010, 2012, 2014, 2015) which maintains that engaging novices to try and even fail at complex, ill-structured tasks, which are often beyond their current abilities, can, under certain circumstances, be productive for developing deeper conceptual understanding. Accordingly, Kapur and Bielzczyc (2012) described the productive failure instructional design as a methodology that typically minimizes performance in the short-term, but supports long-term learning.

The productive failure instructional design consists of two phases: a generation and a consolidation phase. During the generation phase, students solve complex, ill-structured problems that target a concept they have not yet learned (Kapur, 2015). These problems are designed to challenge, yet not frustrate, problem solvers, encourage the use of prior domain knowledge, and offer a variety of paths towards the solution (Kapur & Bielaczyc, 2012; Loibl & Rummel, 2014). The complexity of the problem makes it highly unlikely that students are able

to generate the canonical solution, hence, the failure. Since students usually fail to generate the canonical solution, an instructional phase follows the initial problem-solving foray. Kapur and Bielaczyc (2012) defined this delayed instruction as the consolidation phase. At the onset, student-generated work or examples of typical student responses are compared and contrasted to the canonical solution. Loibl and Rummel (2014) theorized that during this comparison, students realize the limitations and gaps in their generations. The consolidation phase culminates with the teacher demonstrating how the targeted canonical solution is utilized in problem solving. The consolidation phase often ends with students employing the canonical solution to solve practice problems. Past empirical work used to justify the productive failure instructional process include: the theory of desirable difficulties (Bjork, 1994; Schmidt & Bjork, 1992), the inventing to prepare for learning paradigm (Schwartz & Martin, 2004), impasse driven learning (Van Lehn et al., 2003), and "A Time for Telling" (Schwartz & Bransford, 1998), that is, sequencing instruction so that it occurs after an initial problem solving attempt.

The productive failure model was originally tested in physics classrooms (Kapur, 2008), but more recent trials have been conducted in mathematics domains (Kapur, 2014). In earlier studies (e.g. Kapur, 2008, 2012), students worked together in groups of two or three to solve the novel problems, while students in later studies solved problems individually (e.g. Kapur, 2014). In addition, earlier iterations of the productive failure model (e.g. Kapur, 2008) used contrasting-case design (Rittle-Johnson & Star, 2007) as the structure that facilitated consolidation and assembly of students' knowledge. Later studies (e.g. Kapur, 2014) utilized contrasting cases, along with direct instruction provided by an instructor. Initial results indicated that students in ill-structured (productive failure) conditions outperformed their peers in well-structured conditions on both well-structured and ill-structured post-test items (Kapur, 2008).

In 2010, Kapur tested the productive failure model against a direct instruction design. Students in the *lecture and practice* condition were scaffolded throughout the two-week instructional phase. They worked individually to solve well-structured problems, participated in teacher led lectures, received consistent feedback, and regularly completed practice problems. On the other hand, students in the productive failure condition worked collaboratively to solve unscaffolded problems, ultimately receiving a consolidation lecture at the end of the two-week unit. Results indicated that students in the productive failure group had higher mean scores on well-structured post-test questions. Additionally, productive failure students scored higher on a post-test item that introduced a novel concept that was not taught during the two-week long curriculum unit. Finally, after an instructional intervention that had students learn in either a productive failure or direct instruction condition, Kapur (2012) measured both groups' conceptual understanding, procedural fluency, and transfer on a six item post-test. Kapur found that students in the productive failure condition significantly outperformed their peers in the direct instruction group on both conceptual understanding and transfer, while equaling their score on the measure of procedural fluency. These findings indicate that under certain circumstances, introducing difficulties into the acquisition phase of instruction can be beneficial to long term learning (Schmidt & Bjork, 1992).

The preceding section described Kapur's productive failure methodology and highlighted empirical results gathered from his studies. A barrier to implementing productive failure in OAE classrooms may be OAE instructors' personal beliefs about the role of success and failure in educational settings. When considering the topics of success and failure, and specifically how they are utilized in educational contexts, it is important to review literature exploring the relationship between teachers' beliefs and their resulting pedagogical practices. As this literature

shows (e.g. Fang, 1996; Kagan, 1992; Pajares, 1992), teachers hold beliefs about their work, their students, the subject matter they teach, and their instructional roles and responsibilities, and these beliefs can affect the teaching and learning that occurs in their classrooms.

Teachers' Beliefs and their Influence on Instruction

While early teacher beliefs studies correlated observable teaching behaviors with student achievement outcomes, more recent research has examined teachers' beliefs, planning, and decision-making processes (Fang, 1996). The two theoretical assumptions undergirding this research discipline are: "teachers are professionals who make reasonable judgements and decisions within complex and uncertain community, school and classroom environments; and second, teachers' thoughts, judgements and decisions guide their classroom behavior" (Stern & Shavelson, 1981). After reviewing the teacher beliefs literature, Fang (1996) formulated the consistency thesis, which stated that teachers possess theoretical beliefs that shape their instructional practices. On the other hand, the inconsistency thesis noted that the demands of classroom life can hinder teachers from instructing in ways that mirror their theoretical beliefs.

Taylor and Caldarelli (2004) observed that teachers' beliefs are formed through both formal and non-formal educational experiences. By the time pre-service teachers enter college, they have developed specific beliefs about teaching and learning through their observation of and participation in the regimen of formal K-12 education (Pajares, 1992). Once these beliefs are established, individuals construct causal explanations, which may or may not be accurate, that are used to justify them (Pajares, 1992). Pajares (1992) postulated that teachers' beliefs were formulated and reinforced through a self-fulfilling prophecy cycle. That is, teacher's beliefs about teaching and learning influenced their perceptions, those perceptions affected their behavior, behaviors led to outcomes that ultimately corroborated their originally held beliefs.

Ways in which teachers' beliefs have influenced educational practices has been documented in traditional classroom settings (e.g. Fang, 1996; Kagan, 1992; Pajares, 1992); however, there have been relatively few studies documenting the instructional beliefs of OAE instructors.

Taylor and Caldarelli (2004) examined the beliefs and practices of environmental educators working in state and local parks in the Northeastern United States. After conducting semi-structured interviews, Taylor and Caldarelli concluded that these environmental educators' beliefs were shaped by their experiences in both formal and non-formal educational settings, and that environmental education training programs should address how individual beliefs shape pedagogical practice, specifically reflecting on teaching practices that foster learning. Hill (2010) examined the beliefs of outdoor educators in New Zealand. During the interviews with four secondary outdoor education instructors, interviewees described their personal beliefs and how those beliefs manifested themselves during instruction. For example, one outdoor educator indicated that her personal environmental beliefs influenced decisions about what environmental education curriculum units should be incorporated into her teaching plans. Another outdoor education teacher noted a personal belief that outdoor education can increase students' confidence; therefore; he facilitated activities that fostered teamwork, leadership development, and ultimately, personal development. Although there is limited empirical evidence from the OAE literature on instructor beliefs influencing instruction, the research from traditional education is sufficiently vast to allow for the conclusion that OAE instructors' personal beliefs affect their pedagogical practices. As Pajares (1992) recognized, understanding the belief structure of teachers is essential before their teaching practices and professional preparation can be improved.

Research Questions

This study was initiated to investigate two separate research questions. The first question explored OAE instructors' beliefs about the use of success and failure as pedagogical tools. Building upon the first question, the second research question sought to understand the associations between OAE instructors' age, gender, years of professional experience, employer, and the types of activities they instruct and their ensuing beliefs about the use of success and failure as instructional tools.

Method

Participants

The data for this study were gathered from a sample (n=253) of currently practicing OAE instructors over 18 years old who had taught an OAE course within the past year. Fifty-one respondents (20.20%) were 21-25 years old, while 65 (25.70%) were 26-30. Sixty-three (24.90%) individuals were aged 31-35, and the remaining 74 (29.20%) were 36 and older. One hundred twenty-four respondents were female (49.0%), 123 identified as male (48.60%), and six (2.40%) preferred not to respond to this question. As for professional experience, only 2.00% of participants had worked in the OAE field for less than one year, while 30.40% had worked for one to five years, and 28.90% had worked for six to 10 years. Additionally, 19.40% had between 11-15 years of experience, while 19.40% reported they had 16 or more years of OAE professional experience. Respondents were asked to identify as many of the outdoor skills they instructed from a list of 13 possible options (see Figure 1). The top three choices were: backpacking (89.30%), rock climbing (69.20%), and canoeing (47.00%). On the opposite end of the spectrum, only 2.40% selected pack rafting, 7.90% selected sailing, and 7.90% selected caving (see Appendix A). Moreover, one of the possible response choices was *other,* and if respondents checked this selection, they were asked to describe the additional skill areas they

instruct. While the *other* responses were varied, four individuals added whitewater canoeing and three added ice climbing.

Figure 1. Frequency Counts for Activities Instructed

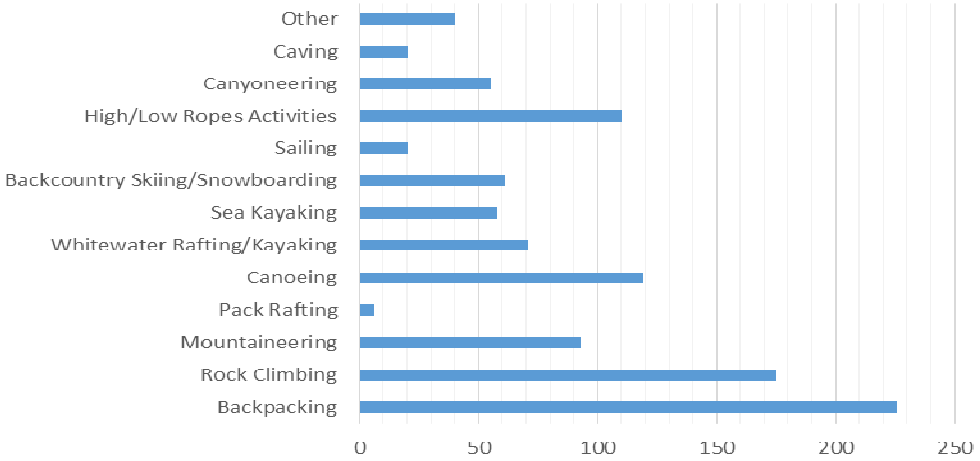

Figure 1. Instructors were asked to select all the skill areas they instruct from a list of 13 possible choices. These are the resulting frequency counts.

Respondents worked for various institutions including NOLS (28.50%) and OB (40.70%), which was further partitioned into the Colorado OB School (7.90%), California OB School (2.00%), and North Carolina OB School (15.00%). This question also included *other*, and two participants indicated they worked for the Hurricane Island OB School and four noted they worked for the Northwest OB School. In addition, respondents worked for guide services (2.40%), residential camps (3.20%), K-12 school-based OAE programs (9.10%), and college/university OAE programs (9.90%). Sixteen individuals (6.30%) selected *other*, and the response entered typically involved a combination of the nine different employers. Of note, nine people indicated working for a wilderness therapy or therapeutic program, which was not originally included as a response choice.

Instrumentation

The data for this study were gathered using a 29-question self-developed, online questionnaire (see Appendix B). The questionnaire consisted of close-ended questions, including Likert-type items, response continuum questions, and demographic questions. The demographic questions gathered data on OAE instructors' age, gender, years of OAE experience, the skills they teach, and their most frequent employer during the past year.

The 16 Likert-type questions (see Table 1) assessed OAE instructors' beliefs regarding productive success and productive failure, and were developed during the literature review process. Each of the 16 questions contained a key construct or belief identified in the productive success or productive failure literature. Eight of the questions addressed productive success, while the other eight addressed productive failure. On the productive success questions, the closer a respondent's answers were to *strongly agree,* the more likely it is that s/he holds productive success instructional beliefs. That is, the instructor believed in the use of productive success instructional techniques like implementing scaffolding to assist in the performance of complex tasks and fading it as students gained competence. On the other hand, on the eight productive failure questions, the closer an individual's answers were to *strongly agree* the more likely it is that s/he holds productive failure instructional beliefs. That is, instructors who believed in the use of productive failure instructional techniques thought that allowing students to struggle and possibly fail at tasks that may be beyond their current abilities is a useful pedagogical strategy for fostering learning.

Table 1

Means and Standard Deviations for the 16 Success and Failure Beliefs Items from the Instrument (n =253)

Survey Question Number	Conceptual Stance	*M*	*SD*
1	Productive Success	3.17	.92
2	Productive Failure	3.86	.84

3	Productive Success	3.87	.75
4	Productive Success	2.38	.97
5	Productive Failure	4.08	.82
6	Productive Success	4.11	.86
7	Productive Failure	2.87	.95
8	Productive Failure	3.32	.81
9	Productive Success	3.47	.87
10	Productive Failure	4.19	.71
11	Productive Success	4.13	.65
12	Productive Success	2.75	.78
13	Productive Failure	3.62	.74
14	Productive Failure	3.65	.77
15	Productive Success	3.91	.77
16	Productive Failure	4.00	.68

Note. These 16 items were scored on a 5-point Likert scale with one being strongly disagree and five being strongly agree.

The eight response continuum questions were divided into two separate sections. The first four response continuum questions sought to understand OAE instructor's pedagogical practices, specifically, what s/he has or would do in a typical OAE scenario. The final four response continuum questions were identical to the first four except respondents were asked to indicate how they preferred to learn, that is, through either productive success or productive failure instructional techniques. The question stem described a scenario, and on one end of the continuum was a productive success response and on the other end was a productive failure response. The respondent placed themselves on one of the seven potential response choices depending on their self-identified instructional practices or learning preferences.

Procedure

Staffing coordinators or human resource personnel from participating organizations received an email that introduced the study and contained a link to the online survey. The staffing coordinators forwarded the introductory email to their staff/faculty email lists. Approximately 1000 potential respondents received an email that introduced the study and

invited them to participate. The link in the introductory email directed respondents to the online survey, which was completed by 253 individuals. Because of the method used to send out the survey, I was not able to determine the exact number of people who were asked to respond, thus I cannot calculate with precision what the response rate was. It was approximately 25%.

Analysis

The analyses described below were based upon a conceptual framework of productive success and productive failure[1] beliefs and practices identified during the literature review process. As the productive failure literature is broad, and cites multiple bodies of empirical literature to support its approach, the 16 productive success and productive failure beliefs items were subjected to principal components analysis (PCA) in order to determine the suitability of the conceptual framework. The initial PCA revealed seven components with eigenvalues above one; however, the scree plot showed a clear break after the second component, and only two components were retained for further analysis (Cattell, 1966). After a varimax rotation, the rotated component matrix showed nine variables loaded on component one, while six loaded on the second component. Component one contained six out of the eight conceptual failure beliefs items, along with three conceptual success items, while component two contained five conceptual success items and one conceptual failure item.

The three conceptual success items that joined with the failure items were reviewed to better understand why they were answered in a similar fashion as the six conceptual failure items. These three success questions ask instructors their beliefs about how to best support or structure OAE student learning. As a field, and particularly with both NOLS and OB, instructors often arrange the course progression so that students have greater autonomy as the course

[1] For ease and clarity of reading, throughout the remainder of this paper, the word *productive* will not be used before success or failure when describing the results of the statistical analysis.

progresses (Daniel, Bobilya, Kalisch, & McAvoy, 2014; Gookin & Swisher, 2015), with autonomy being defined as giving "participants a greater measure of choice and control over the planning, execution, and outcomes of their learning" (Daniel et al., 2014, p. 1). This philosophical viewpoint is cited in OAE institutional (e.g. Gookin & Swisher, 2015) and academic (e.g. Daniel, Bobilya, Kalisch, & McAvoy, 2014) literature, and the value of ASE experiences has been measured in empirical studies (Sibthorp, Paisley, Gookin, & Furman, 2008). Since the current professional practices in the OAE field incorporate the fading of structure and support resulting in greater student autonomy, instructors may be inculcated with the belief that this structure regimen is the best option for OAE students, or if not, they are expected to employ it while working professionally in the OAE field. This may be why these three conceptual success beliefs items were answered in a similar fashion as the six conceptual failure items, that is, with a higher response rate of agree and strongly agree on the 5-point Likert scale used in the accompanying questionnaire. Therefore, in the following sections, the conceptual framework will be retained and subsequently analyzed.

Before beginning statistical analysis, the eight success beliefs items (α=.38) were combined and a 5-point success mean item score was calculated. A similar procedure was employed to create a failure (α=.43) mean item score. Both the instructional practice and personal learning preference sections contained four questions (α=.74), and instructional practice and personal learning preference mean item scores were computed for each individual on a 7-point scale. These four measures became the dependent variables used in this study. For the ensuing statistical analysis, the data gathered from Likert-scale items were considered an interval-scale variable, and were analyzed using parametric statistical tests. In the OAE literature, there is precedent for considering responses to Likert-scale items as interval-scale data

(e.g. Furman & Sibthorp, 2014; Neill & Dias, 2001), and this study continued in that established tradition.

Results

Success and Failure Beliefs of OAE Instructors

After the data were screened and cleaned, the eight success items were combined, and an overall success mean item score (n=253, M=3.47, SD=.36) was calculated, with one equaling low and five indicating high success instructional beliefs. A similar procedure was used to compute a failure mean item score (n=253, M=3.70, SD=.36), with one indicating low and five equaling high failure instructional beliefs (see Figure 2). The reported success beliefs mean item score was higher than the corresponding failure beliefs mean item score for 75 (29.64%) respondents. On the other hand, 158 (62.45%) participants reported failure beliefs mean item scores that were higher than their corresponding success beliefs mean item scores. The remaining 20 (7.91%) individuals reported success beliefs mean item scores that equaled their failure beliefs mean item scores.

The mean responses for the success items ranged from 2.25 to 4.38, with the median score being 3.50, while the failure scores ranged from 2.75 to 4.75 with the median being 3.75. Using the median success (3.50) and failure (3.75) item scores as the axes of a four-quadrant graph, respondents were placed into one of the four quadrants based upon their reported success and failure beliefs. Thirty-eight instructors (15.02%) reported having both high success and high failure beliefs, while 48 (18.97%) indicated high failure combined with low success beliefs. In addition, 55 instructors (21.74%) noted both failure and success beliefs below the medians, while an additional 55 (21.74%) reported high success beliefs coupled with low failure beliefs. The remaining 57 (22.53%) received at least one score positioned at the median. A paired sample t-

test was calculated to determine whether there was a statistically significant mean difference between instructors' reported success and failure beliefs. Instructors' failure beliefs mean item scores were significantly higher t (252) =7.27, p <.001, d =.46, r =.06, 95% CI [.16, .29] than their success mean item scores.

Figure 2. Reported Productive Success/Productive Failure Beliefs of OAE Instructors

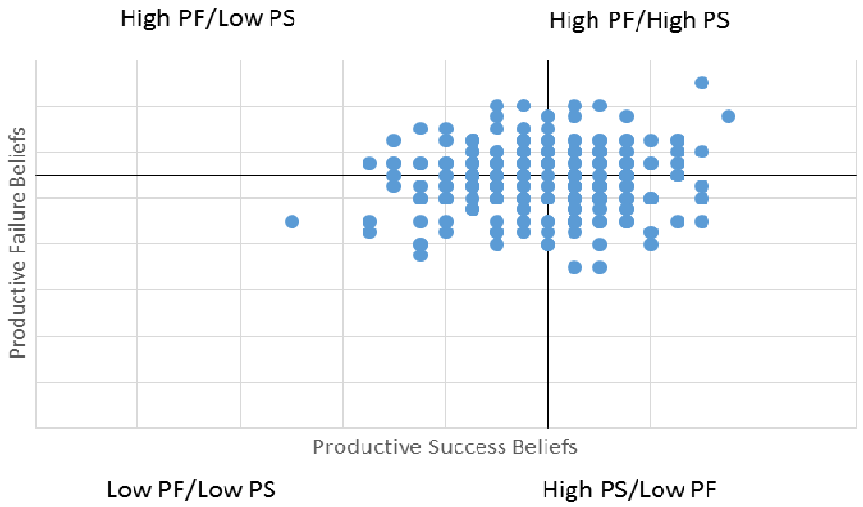

Figure 2. Respondents' productive success and productive failure beliefs were plotted into four quadrants. The axes represent the median productive success (3.50) and median productive failure (3.75) item scores.

The first four response continuum questions asked participants to indicate, on a 7-point scale, how they have or would respond to the scenario presented in the item stem. A productive failure response was positioned on one side of the continuum, and the corresponding productive success response was situated on the other. After reverse scoring two of the items, participants scoring closer to one demonstrated productive failure instructional practices, while respondents with scores closer to seven expressed productive success instructional practices. Overall mean instructional practice item scores were (n=253, M=3.77, SD=.86), which is below the mid-point and slightly closer to the productive failure end of the scale. However, 33% of respondents responded with instructional practice mean scores above the mid-point of 4.00, while 15%

responded with a mean score of exactly 4.00. Although instructors professed varying beliefs in the use of both success and failure as instructional tools, the mean instructional practice score of this group of OAE instructors landed on the productive failure end of the continuum.

The learning preference questions asked respondents to identify whether they preferred to learn via success or failure techniques, and were analyzed and scored using the above mentioned procedure. Overall learning preference mean item scores were (n=253, M=3.51, SD=1.14), again, slightly closer to the productive failure end of the continuum.

In order to understand the relationships among the four dependent variables, correlations were computed (see Table 2). There was a moderate, positive correlation (r =.60, n =253, p <.01) between personal learning preference mean item scores and instructional practice mean item scores, with high success learning preferences associated with greater belief in the utilization of success instructional techniques. Instructors' personal learning preference accounted for 36% of the variance in respondents' scores on the instructional practice items. In order to further examine this relationship, the data were examined to ascertain the effects of gender on the correlation between learning preference and reported instructional practices. There was a moderate, positive correlation (r =.68, n =124, p <.01) between female instructors reported learning preferences and instructional practice scores, with learning preferences accounting for 46% of the variance in female instructors' responses to the instructional practice items. Additionally, there was also a moderate, positive correlation (r =.52, n =123, p <.01) between male instructors' reported learning preferences and instructional practice mean scores. Although there were positive correlations for both female and male instructors, the Fisher r to z transformation was used to assess the significance of the difference. The correlation between female OAE instructors' learning preferences and instructional practices was significantly higher

(z =1.96, p=.05) than their male counterparts, with personal learning preferences accounting for more of the variance in instructional practice scores for female instructors than male instructors.

Table 2

Zero Order Correlation Matrix for the Dependent Variables

Dependent Variable	PS	PF	Practice	Preference
Productive Success	1.00			
Productive Failure	0.06	1.00		
Instructional Practice	0.25*	-0.21*	1.00	
Personal Learning Preference	0.20*	-0.23*	0.60*	1.00

Note. PS = Productive Success; PF = Productive Failure; Practice = Instructional Practice; and Preference = Personal Learning Preference. An asterisk (*) indicates the correlation was significant at $p < .01$ (two-tailed).

Associations between Demographic Data and Success and Failure Beliefs

In order to understand the associations between OAE instructors' age, gender, professional experience, and the activities they instruct upon their reported success and failure beliefs (see Table 3), two-way between-subjects ANOVAs were calculated. To begin, the impact of gender and age on reported success and failure beliefs and instructional practices were examined. The 10 original age groupings were collapsed into three groups (Group 1: 30 years and under, *n=116*; Group 2: 31-40, *n*=85; and Group 3: 41 and over, *n*=52). This was done to create more equally sized groups, while concurrently striving to retain the nuances associated with particular age groups. On the survey, three possible gender response choices were offered: male, female, and prefer not to respond. Six participants preferred not to respond, and their responses were excluded from subsequent gender analyses. When analyzing reported failure beliefs, there was no significant interaction between age and gender (F (2, 241) =2.24, p=.11). In addition, the main effect for gender was not statistically significant. However, there was a significant main effect for age (F (2, 241) =3.17, p=.04, partial η^2 =.03). Post hoc analysis indicated that instructors in the 30 and under group (M =3.78, SD =.36) reported significantly

higher failure beliefs than their counterparts in the 41 and over group (M =3.59, SD =.31). The effect size was small (partial η^2 =.04), indicating that 4% of the variance in self-reported failure beliefs is explained by instructors' age. For the reported success beliefs, there were no significant interaction effects between age and gender, nor were there significant main effects for age or gender. For the reported instructional practices, the interaction between age and gender was not significant. Furthermore, there were no main effects for age or gender.

Respondents were asked to indicate the amount of time they have worked in the OAE field in one of five categories ranging from less than one year to 16 years or more. Because only five respondents signaled they have less than one year of professional experience, that category was collapsed into the one to five years of experience group, creating four groups with differing levels of experience (Group 1: 0-5 years, n =82; Group 2: 6-10 years, n =73; Group 3: 11-15 years, n =49; and Group 4: 16 or more years, n =49). The impact of gender and professional experience on success and failure beliefs and instructional practice was also analyzed. There was a significant main effect for experience (F (3, 239) =3.00, p =.03, partial η^2 =.04) on failure beliefs, with post hoc tests showing that outdoor educators with zero to five years of experience (M =3.77, SD =.35) reported significantly higher failure beliefs than those instructors with 16 or more years of experience (M =3.58, SD =.33). Moreover, instructors with six to 10 years of experience (M =3.75, SD =.35) also expressed significantly higher failure beliefs than their peers with 16 or more years of experience. The main effect for gender (F (1, 239) =1.63, p =.20) did not reach statistical significance. In addition, there was no significant interaction effect between gender and experience. As for success beliefs, the interaction between experience and gender was not significant. Furthermore, there were no significant main effects for either experience or gender. An analysis of reported instructional practices yielded similar results. The interaction

effect between experience and gender was not significant, and there were no statistically significant main effects for experience or gender.

Participants were asked to select, from a list of 10 possible choices, the company or type of work they performed most frequently during the past year. The responses were collapsed into three separate groups (Group 1: NOLS, *n*=72; Group 2: OB, *n* =109; Group 3: School-based OAE, *n* =56). Those respondents who chose *other*, and subsequently wrote in an OB school not listed or who worked for multiple OB schools were added to the OB group (*n* =6). Data from those individuals who indicated that they were employed by a guide service (*n* =6), and those who selected *other* and noted that they worked for various programs (i.e. NOLS and OB) (*n* =10) were removed from this analysis. A third two-way between groups ANOVA was conducted to understand the impact of gender and an individual's employer on failure beliefs. There was no significant interaction between gender and employer (F (2, 225) =1.09, p =.34). However, there was a statistically significant main effect for employer (F (2, 225) =3.94, p =.02, partial η^2 =.04) on instructors' reported failure beliefs, with Tukey's HSD post hoc analysis indicating a significant difference between the reported failure beliefs of instructors working for NOLS (M =3.63, SD =.33) than those working for OB (M =3.78, SD =.34). While the results reached statistical significance, the difference in mean scores was relatively small, and the effect size (partial η^2 =.04) was small as well, indicating that 4% of the variance in reported productive failure beliefs could be accounted for by the respondents' employer. The main effect of gender (F (1, 225) =3.80, p =.052) was approaching significance, with female instructors (M =3.76, SD =.37) reporting higher failure beliefs than their male peers (M =3.66, SD =.33). An analysis of instructor's reported success beliefs revealed no significant main effects for either employer or gender. Moreover, the interaction between employer and gender did not reach statistical

significance. The examination of respondents' reported instructional practices provided similar results. There were no significant interaction effects between employer and gender, and the main effects of employer and gender were not significant.

In order to understand how the activities an instructor facilitates impacts their success and failure beliefs and their instructional practices, the responses to the activities instructed question were tallied, and each instructor was placed into one of four separate groups (Group 1: land-based, n =74; Group 2: mountain-based, n =50; Group 3: water-based, n =36; Group 4: multiple disciplines, n =92). One respondent indicated that s/he currently worked in the OAE field in an administrative capacity, and her/his data were excluded from this analysis. Individuals in the land-based group primarily instructed backpacking, high and low ropes activities, canyoneering, and caving, while instructors in the mountain-based group taught rock climbing, mountaineering, and backcountry skiing and snowboarding. Individuals who primarily instructed pack rafting, canoeing, white water rafting or kayaking, sea kayaking, and sailing were placed into the water-based group. Individuals whose tallies between two activities were equal, for example, an instructor indicated that s/he taught two land-based and two water-based activities, were added to the multiple discipline group.

The final two-way between-groups ANOVA was computed to understand the impact of gender and the activities an OAE instructor teaches on failure beliefs. There was no significant interaction between gender and activity. Also, the main effect of gender did not reach statistical significance. However, the main effect of activity instructed was significant (F (3, 238) =3.31, p =.02, partial η^2 =.04). Tukey's HSD post hoc analysis showed a significant difference between instructors who teach land-based (M =3.81, SD =.33) activities compared to instructors who teach mountain-based (M =3.59, SD =.38) activities. Although there was a significant difference

between the failure beliefs of land-based and mountain-based instructors, the effect size was small (partial η^2 =.04), with 4% of the variation in instructors' failure beliefs explained by the activity they instruct. The interaction between activities instructed and gender on instructors' success beliefs was not significant. Furthermore, there were no significant main effects for either activities instructed or gender. A review of respondents' reported instructional practices revealed no significant interaction between activities instructed and gender. In addition, the main effects for activities instructed and gender did not reach statistical significance.

Table 3

Means and Standard Deviations of the Productive Success, Productive Failure, and Instructional Practice Variables Broken Down by the Five Demographic Variables

		Productive Success		Productive Failure		Instructional Practice	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age							
30 and under	116	3.51	.35	3.77*	.36	3.82	.88
31-40	85	3.46	.35	3.67	.36	3.76	.85
41 and over	52	3.41	.39	3.59*	.36	3.68	.87
Gender							
Female	124	3.49	.36	3.74	.39	3.72	.90
Male	123	3.46	.36	3.67	.32	3.82	.83
Did not Respond	6	3.38	.32	3.46	.40	3.75	.67
		Productive Success		Productive Failure		Instructional Practice	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
Experience							
0-5 years	82	3.51	.34	3.77*	.34	3.86	.77
6-10 years	73	3.51	.34	3.75*	.35	3.66	.77
11-15 years	49	3.45	.37	3.64	.38	3.90	.82
16 or more years	49	3.36	.44	3.58*	.33	3.65	.84
Employer							
NOLS	72	3.47	.33	3.63*	.33	3.92	.81
OB	109	3.46	.37	3.78*	.34	3.71	.93
School-based OAE	56	3.50	.40	3.67	.38	3.67	.87
Guide Service	6	3.44	.23	3.81	.56	3.58	1.03
Activity Instructed							
Land-based	74	3.41	.38	3.81*	.33	3.74	.78
Mountain-based	50	3.50	.38	3.59*	.38	3.91	.73
Water-based	36	3.45	.34	3.67	.39	3.48	.99
Multiple Disciplines	92	3.51	.34	3.69	.34	3.83	.94

Note. The productive success data are the calculated mean item scores of the eight productive success beliefs questions from the questionnaire. Likewise, the productive failure data are the calculated mean item scores of the eight productive success beliefs items from the questionnaire. Both variables are measured on a 5-point Likert scale. For the productive success and productive failure measures, responses closer to five indicate stronger beliefs and responses closer to one signal weaker beliefs. The instructional practice data are the mean item scores of the four instructional practice response continuum questions. These items were scored on a 7-point Likert scale with mean item scores closer to one indicating productive failure instructional practices, while mean item scores closer to seven indicate productive success instructional practices. An asterisk (*) indicates post hoc tests found significant differences between these mean item scores.

General Discussion

This research study set about to answer two questions: (1) what are OAE instructors' beliefs about the use of success and failure as instructional tools in OAE courses?; and (2) what are the associations between OAE instructors' demographic data or learning preferences and their beliefs about the use of success and failure during OAE courses? Each of these questions is addressed in turn.

Previous OAE studies have not explored the instructional beliefs, specifically in regards to the use of success and failure as pedagogical tools, of OAE instructors. OAE instructors participating in this study reported varied success and failure beliefs, and in particular, their age, professional experience, employer, and the activities they instruct influenced the magnitude of respondents' failure beliefs. Of the eight conceptual success items, respondents indicated the highest levels of agreement with survey questions six and 11 (see Table 1), which asked instructors their personal beliefs regarding the use of support and autonomy during instruction. The high responses signaled that this sample believed student autonomy should be encouraged as OAE courses progress, and that instructor support structures should be faded away as students gain competence. These views are not surprising, as encouraging student autonomy is often an important component of many OAE programs (Daniel, Bobilya, Kalisch, & McAvoy, 2014)

including both NOLS (Gookin & Swisher, 2015) and OB (Walsh & Golins, 1976). However, this sample of OAE instructors did not report statistically significant differences in success beliefs among instructors of different ages, different genders, with varying levels of professional experience, who teach land-, mountain-, or water-based activities, or who worked for different OAE programs.

Of the eight conceptual failure items, respondents reported the highest levels of agreement with survey questions five and 10 (see Table 1). By expressing high levels of agreement with these questions, respondents indicated they believed that OAE students should have opportunities to struggle and fail, and that successfully completing a task does not necessarily imply that learning has occurred. While the reported success beliefs mean item scores among the demographic categories were similar, there were significant differences in the magnitude of failure beliefs reported by the differing demographic categories. Instructors grouped in the 41 years old and older cohort reported significantly lower failure beliefs than their peers who were 30 and younger (see Table 2). When reviewing the failure beliefs mean item scores among the three age cohorts, there was a downward trend in reported failure beliefs as instructors aged. Instructors aged 30 and under reported the highest failure beliefs, followed by instructors aged 31-40, followed by instructors aged 41 and over. However, this study did not track longitudinal changes in instructors' failure beliefs as they aged, so I cannot ascertain if reported beliefs in the use of failure as an instructional tool changes over time, or if the downward trend observed in this study was unique to these participants, perhaps reflecting cohort effects associated with either changes in how these instructors were prepared or changes in prevailing cultural norms and practices about the roles of success and failure in learning.

A similar trend was observed in the professional experience data. There was a significant difference in the reported failure beliefs of respondents with 16 or more years of OAE professional experience compared to instructors with zero to five years of experience. The instructors with the least experience reported the highest failure beliefs followed closely by their peers with six to 10 years of experience, while instructors with 16 or more years of experience noted the lowest reported failure beliefs. Like the age group cohorts, there is a clear downward trend in failure beliefs among the four experience categories as experience level increases, but this study's design precludes the conclusion that reported failure beliefs decrease as OAE instructors gain professional experience.

Data analysis revealed a significant difference in the reported failure beliefs of OAE instructors who teach land-based versus instructors who teach mountain-based activities. Instructors in the mountain-based category primarily teach rock climbing, mountaineering, and backcountry skiing/snowboarding, while instructors in the land-based group primarily teach backpacking, high/low ropes activities, canyoneering, and caving. Real and perceived risk is an inherent component of all OAE activities (Nichols, 2000; Priest, 1999b); however, the reported difference among the failure beliefs of these two groups of instructors may indicate that mountain-based instructors' reported failure beliefs are influenced by the activities they instruct. That is, rock climbing, mountaineering, and skiing/snowboarding instructors may perceive greater inherent risk, because of the objective hazards (e.g. avalanche or rockfall) associated with the activities they instruct, than their peers who work in land-based activities. As the perceived cost of failure is much higher for OAE students in mountain-based activities, an instructor working in mountain-based environments may structure experiences that result in student success rather than failure or facilitate failure experiences that are actively controlled and

managed (Nicolazzo, 2004). Of note, the data showed that mountain-based instructors reported higher success beliefs than their peers who instruct land-based activities.

Results indicated a significant difference between the reported failure beliefs of OB instructors versus their peers at NOLS, with OB instructors' reporting significantly higher failure beliefs. This finding is not surprising, as one of OB's institutional beliefs is that its students should learn from both success as well as failure (Outward Bound [OB], 2015). Moreover, Kurt Hahn, the father and philosophical voice behind OB programming, advocated for a pedagogy that encouraged students to "defeat [their] defeatism" (Miner, 1999, p. 59) and not be discouraged by setbacks, but use them as opportunities for growth (Richards, 1999). This finding demonstrates that the pedagogical ideals Hahn instituted 75 years ago when OB was founded are still being instilled in OB instructors today.

Although there were significant differences in the magnitude of reported failure beliefs among the variables of age, years of experience, activity instructed, and employer, these differing beliefs did not translate into significantly different instructional practice mean item scores between the groups. In fact, this sample's instructional practice mean item score was closer to the productive failure end of the continuum, and 52% of respondents received an instructional practice mean score below the 4.00 mid-point of the scale. Although individual instructors may have varying success and failure beliefs, the pedagogical and problem posing practices typically employed in OAE classrooms closely resemble the practices advocated for by productive failure theorists (e.g. Kapur & Bielaczyc, 2012). Collins, Paisley, Sibthorp, and Gookin (2012) described the typical curricular task employed in OAE contexts as "ill-structured" (Collins, Paisley, Sibthorp, & Gookin, 2012, p. 190), and ill-structured tasks often "do not have definitive answers, and may need to be defined and redefined multiple times for students to

understand their full complexity" (Collins et al., 2012, p. 190). Furthermore, these tasks may not have right or wrong answers, but certain responses may be better or worse depending on the specific situation (Collins et al., 2012). Therefore, OAE instructors are continually posing problems that have multiple solutions, may be difficult to structure, and will inherently cause students to make errors as they work towards resolution of the problem, all of which are key components of Kapur's productive failure educational approach (Kapur & Bielaczyc, 2012). Ultimately, this may be one explanation for why this sample of OAE instructors reported instructional practices that landed on the failure end of the response continuum.

For this sample of OAE instructors, their reported personal learning preferences were more strongly correlated with resulting instructional practices than their success or failure beliefs (see Table 1); however, as Fang (1996) and others (Kagan, 1992; Pajares, 1992) observed, educators' beliefs often influence their pedagogical practices. Furthermore, Stern and Shavelson (1983) noted that teachers are professionals who make pedagogical decisions in complex classroom environments. Therefore, understanding educators' thought processes and beliefs is a prerequisite for comprehending their pedagogical practices (Clark & Peterson, 1986). Based upon this reasoning, what do OAE instructors' reported success and failure beliefs tell us about the teaching that occurs in OAE classrooms? Instructors reported high levels of support for encouraging initial student success, particularly through the use of various scaffolding techniques, and then fading these supports as students gain competence. Encouraging student success may be facilitated by breaking down complex tasks into their component parts and helping students master the individual component before allowing them to attempt the whole task, and this practice was supported by many respondents (see survey question 6). On the other hand, instructors reported a high level of agreement with the notion that successful completion of

a task does not imply that learning has occurred, and students should be allowed to struggle and possibly fail during OAE tasks. Based upon respondents reported beliefs, it appears that success strategies may be employed at the onset of an OAE course or when students are learning a new skill, while failure related pedagogical techniques may be utilized as students gain competence and are ready for a more challenging activity, as a perception check for both the student and the instructor to measure students' abilities and illuminate current gaps in students' knowledge (Loibl & Rummel, 2014; Schumann, Sibthorp, & Hacker, 2014), or as a component of an institutionally defined curriculum progression (Daniel, Bobilya, Kalisch, & McAvoy, 2014).

Areas for Future Research

This research explored the success and failure beliefs and practices of OAE instructors using quantitative data. Further exploration of this topic employing qualitative methods may help better explain the differences in magnitude of older and more experienced instructors' failure beliefs in relation to their younger and less experienced peers. Furthermore, this study did not address what factors led OAE instructors to select and subsequently employ success or failure instructional techniques, and the field would benefit from an understanding of instructors' criterion for employing success or failure pedagogical techniques. The majority of this sample (69%) worked for either OB or NOLS. Being two of the largest providers of OAE courses in the United States, both organizations are regularly subjected to empirical examinations (e.g. Daniel, Bobilya, Kalisch, & McAvoy, 2014; McKenzie, 2003; Sibthorp, Paisley, & Gookin, 2007). Making a concerted effort to incorporate the instructional beliefs and practices of OAE instructors working for other organizations, companies, or guide services will complement the current literature.

Limitations of this Study

This study used a self-report questionnaire as its sole data collection instrument. Self-report measures could be influenced by four separate problems: socially desirable responses, self-deception, semantic problems, and criterion inadequacy (Hopkins, 1998; Johnson & Christensen, 2014). Although previous OAE literature advocated for the provision of success to OAE students (e.g. Kimball & Bacon, 1993), 158 (62.45%) of respondents from this sample reported failure beliefs that were higher than their respective success beliefs, and the overall instructional practice mean item score was closer to the failure end of the continuum. Therefore, it does not appear that this sample was influenced by reporting socially desirable responses. On the other hand, self-deception could have been an issue in this study. The questionnaire asked participants to identify their beliefs and corresponding instructional practices. As this questionnaire did not include an observational measure to corroborate instructors' self-reported practices, there is the potential that respondents misrepresented their actual pedagogical practices, which ultimately may have influenced this study's results. As this study assessed the success and failure beliefs of participants, there is the possibility of differing semantic interpretations for pedagogical terms like *support* or *structure*. However, the questionnaire was pilot tested with a group of OAE instructors who resembled the target population, and adjustments were made to the instrument to minimize the likelihood of this occurrence. As this was the first known study to examine the success and failure beliefs of OAE instructors, the questionnaire had to be created especially for this study. Unfortunately, there is not another similar instrument available that could be used as a definitive measure to assess respondents' replies.

Appendix A—Tables 4 and 5

Table 4

Mean Scores and Standard Deviations for the Productive Success/Productive Failure Variables from the Activities Instructed Demographic Question

		Productive Success		Productive Failure	
Activity	*n*	*M*	*SD*	*M*	*SD*
Backpacking	226	3.47	.35	3.71	.35
Rock Climbing	175	3.37	.35	3.71	.35
Mountaineering	93	3.48	.35	3.67	.37
Packrafting	6	3.67	.33	3.38	.47
Canoeing	119	3.44	.36	3.71	.37
Whitewater Rafting/ Kayaking	71	3.42	.33	3.67	.38
Sea Kayaking	58	3.44	.39	3.63	.33
Backcountry Skiing/ Snowboarding	61	3.44	.39	3.59	.35
Sailing	20	3.43	.32	3.67	.41
High/Low Ropes	110	3.43	.38	3.75	.33
Canyoneering	55	3.41	.34	3.69	.38
Caving	20	3.24	.39	3.69	.41
Other	40	3.53	.38	3.71	.35

Note. The productive success data are the calculated mean item scores of the eight productive success beliefs questions from the questionnaire. Likewise, the productive failure data are the calculated mean item scores of the eight productive success beliefs items from the questionnaire. Both variables are measured on a 5-point Likert scale. For the productive success and productive failure measures, responses closer to five indicate stronger beliefs and responses closer to one signal weaker beliefs.

Table 5

Mean Scores and Standard Deviations for the Instructional Practice and Personal Learning Preference Variables from the Activities Instructed Demographic Question

		Instructional Practice		Personal Learning Preference	
Activity	*n*	*M*	*SD*	*M*	*SD*
Backpacking	226	3.77	.88	3.48	1.13
Rock Climbing	175	3.75	.87	3.48	1.13
Mountaineering	93	3.83	.86	3.46	1.15
Packrafting	6	4.21	1.28	3.25	.95
Canoeing	119	3.66	.91	3.48	1.18
Whitewater Rafting/ Kayaking	71	3.68	.88	3.38	1.09
Sea Kayaking	58	3.66	.94	3.36	1.25
Backcountry Skiing/ Snowboarding	61	3.89	.92	3.42	1.04
Sailing	20	3.36	.83	3.23	1.05
High/Low Ropes	110	3.73	.86	3.49	1.14
Canyoneering	55	3.66	.88	3.39	1.02
Caving	20	3.71	.82	3.20	.99
Other	40	3.77	.84	3.48	1.08

Note. The instructional practice data are the mean item scores of the four instructional practice response continuum questions, while the personal learning preference data are the mean item scores of the four learning preference items. These items were scored on a 7-point Likert scale with mean scores closer to one indicating productive failure instructional practices or personal learning preferences. On the other hand, mean scores closer to seven indicate productive success instructional practices or personal learning preferences.

Appendix B—The Questionnaire Used for this Study

Examining the Beliefs and Practices of Outdoor Educators

For questions 1-16, choose your level of agreement with each of the following sentences.

1. Initial learning and practice of a new concept or skill should be structured so that students understand it right away. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. Initial learning that is effortful or challenging fosters greater long-term learning. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. I break down complex tasks into component parts, and then help my students master the individual components before allowing them to attempt the whole task. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. Allowing students to perform a task incorrectly may hinder performance and result in students becoming confused. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. Learners should be allowed to struggle and possibly fail at tasks that may be beyond their current abilities. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. As students gain competence, instructor support should be reduced or faded away. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

7. Students need to reach an impasse or roadblock during problem-solving attempts for learning to occur. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. During instructional activities, instructor implemented supports may encourage students to solve problems in a particular fashion, which limits students' creativity. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. Unsupported or minimally supported activities may result in frustrated or less motivated learners. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

10. Successfully completing a task does not necessarily imply that learning occurred. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

11. The combination of encouraging initial success while gradually fostering learner autonomy is optimal for outdoor adventure education students. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

12. Students should be given immediate feedback when they commit an error. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

13. The pursuit of continual success may cause educators to ignore or minimize failure experiences that occur during learning. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

14. Students can begin problem-solving tasks before they are provided with relevant background information. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

15. With the assistance of someone more knowledgeable, students can perform more complex tasks than they would otherwise be capable of performing on their own. *(Choose 1)*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

16. Activities that help students recognize their knowledge gaps promote curiosity and a desire to learn. *(Choose 1).*

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

For questions 17-20, read the scenario, and then, thinking back to the last course you worked, place yourself on the continuum based upon how you most frequently responded.

17. When students make mistakes, I… *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

stop them and help them correct their error. — let them continue until they realize their error.

18. When teaching, I begin with… *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

problem-solving followed by instruction. — instruction followed by problem-solving

19. When planning and implementing course activities, I…*(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

attempt to <u>structure</u> complex problems before students work through them. — leave the complex problems <u>unstructured</u> and allow students to work through them.

20. The problems I pose… *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

have multiple solutions and can be solved in various ways. — often have a single solution and are solved in a specific fashion.

*For questions 21-24, read the scenario, and then, place **yourself** on the continuum based upon how **you would describe yourself** as a **learner**.*

21. I would like …(*place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

complex problems structured before I attempt them.

complex problems to remain unstructured so that I can figure out how to work through them.

22. I prefer … *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

to attempt to solve problems before receiving instruction.

to receive instruction before attempting problem-solving.

23. I prefer solving problems that… *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

have multiple solutions and can be solved in various ways.

often have a single solution and are solved in a specific fashion.

24. When I make a mistake, I… *(place yourself on one of the dots)*

●----------●----------●----------●----------●----------●----------●

want to be stopped and corrected as soon as possible.

want to continue until I realize the error and can then take steps to correct it.

Questions 21-25 gather participant demographic data. Please follow the instructions associated with each question.

25. My age is… *(Choose 1).*

○ 20 and under	○ 36-40	○ 56-60
○ 21-25	○ 41-45	○ 61 and over
○ 26-30	○ 46-50	
○ 31-35	○ 51-55	

26. My gender is… *(Choose 1).*
○ Female
○ Male
○ Prefer not to respond

27. I have worked as an outdoor adventure education instructor for… *(Choose 1).*
○ Less than 1 year
○ 1-5 years
○ 6-10 years
○ 11-15 years
○ 16 years or more

28. I teach… *(Select all that apply)*

○ Backpacking	○ Canoeing	○ Sailing
○ Rock Climbing	○ Whitewater Rafting/Kayaking	○ High/Low Ropes Activities
○ Mountaineering	○ Sea Kayaking	○ Canyoneering
○ Pack Rafting	○ Backcountry Skiing/Snowboarding	○ Caving

○ Other_____

29. I work for… *(Select the organization, or type of organization, you worked for most frequently during the past year)*
○ NOLS
○ Outward Bound
○ K-12 School-based outdoor adventure education program
○ College/University outdoor program
○ Guide service
○ Residential camp
○ Other_____

Thanks for your participation and thoughtful responses!

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