

# **Factors Affecting Workplace Outcomes: Examining the New Zealand Army’s Experiential Leadership Courses**

**Heather M. Rhodes**  
**Andrew J. Martin**  
Massey University

## **Abstract**

In this case study, we specifically examined the course factors that influenced the changes published by Rhodes and Martin (2013), who examined the extent and type of changes in workplace attitudes and behavior as reported by soldiers who had participated in 6- to 12-day Experiential Leadership Development Activities (ELDAs) delivered by the New Zealand Army Leadership Centre (NZALC) and as reported by their colleagues. The findings were based on analysis of a questionnaire administered to participants ( $N = 50$ ) and their workplace colleagues 8 weeks after the course. The findings indicate the key factors influencing the degree to which students changed after the course were being challenged during their course, understanding the relevance of the course and their learning to the workplace, and having mechanisms and strategies in place after the course to remind them of their learning and encourage further reflection. This research provides greater understanding of how outdoor adventure education courses affect participant development outcomes and of the benefit of postcourse reflection and peer feedback in enhancing application of learning in the workplace.

KEYWORDS: outdoor adventure; outcomes; workplace

A central question in outdoor adventure education is no longer, do outdoor courses result in any positive changes among participants? Rather it is, what aspects of participation in courses will promote more change? (Goldenberg, 2002). In this case study, we focused on soldiers participating in 6- to 12-day Experiential Leadership Development Activities (ELDAs) delivered by the New Zealand Army Leadership Centre (NZALC). Our findings (Rhodes & Martin, 2013) indicate almost all participants (94%) perceived improvements in their own attitude and/or behavior, the main changes being in the areas of improvements in dealing with challenges and having a more positive attitude. Observations made by workplace colleagues of ELDA participants corroborated the self-report data (71% having noticed positive changes), both reports being made on average 4 months after a course. In this article, we examine the factors that influenced these participants' workplace changes. The findings are based on a questionnaire administered to participants ( $N = 50$ ) and workplace colleagues 8 weeks after the course. A surfeit of factors have been identified by theory (McKenzie, 2000), but we have limited our introduction to pre-, during-, and postcourse factors (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012) for which empirical evidence exists.

### **Precourse Factors**

By precourse, we refer to antecedent factors (Sibthorp, 2003), those which exist prior to participants arriving on a course. These may be malleable (e.g., participant expectation for personal change as a result of course attendance, which could conceivably be modified prior to their arrival), but more often are set—for example, demographic characteristics of participants such as age (Hattie, Marsh, Neill, & Richards, 1997) or gender (McKenzie, 2003). Sibthorp, Paisley, and Gookin (2007) found that the more prior experience participants held in a pursuit, the less they gained from a course based on that pursuit. Furthermore, one of the most influential precourse factors, with regard to postcourse outcomes, is participant expectations. Participant expectations for achievement have been shown to be a good predictor of academic success (e.g., House, 1995), and participant expectations for personal change after participation in a course have been found to affect outcomes indirectly (Sibthorp & Arthur-Banning, 2004).

Sibthorp (2003) pointed out that in regard to course design for maximal participant outcomes, understanding antecedent variables is likely of less importance as providers may have little or no input into the characteristics of participants who turn up on the first day of a course. However, understanding differences in outcome for different demographics may allow program organizers to target their delivery, market their courses more effectively, or screen participants prior to arrival.

### **During-Course Factors**

We have categorized variables that characterize the course, or participants' perceptions of the course as measured directly at its end, as during-course variables. These are factors that providers and instructors may be able to manipulate. For example, meta-analyses indicate that longer course length is reasonably consistently related to improved outcomes (Cason & Gillis, 1994; Hattie et al., 1997); the presence of challenge during the course is also often cited as critical for participant development (e.g., McKenzie, 2000); and the provider can potentially manipulate both of these variables. However, in regard to the degree of challenge provided, McKenzie (2003) expressly pointed out that participants sometimes saw fear and failure to achieve success as negative course aspects. Leberman and Martin (2003) also identified that activities which participants perceive pushed them out of their comfort zones may not necessarily result in peak learning experiences.

Notably, instructors' ratings of the relative effect of different during-course components or factors may be consistently different than participants' ratings (Sibthorp, 2003). Additionally, instructors' ratings of the during-course components may be different from participants' ratings; for example, an instructor may perceive that a course is only moderately physically challenging, but participants on the course may find the degree of challenge to be extreme. In most work in which during-course moderators have been investigated, the variables have been measured via participant perceptions. Participants who report a greater degree of empowerment (perceived responsibility and decision making) in their course and understand the relevance of course learning to their own situation are more likely to demonstrate greater improvements in course outcomes (Sibthorp, 2003). End-of-course outcomes have been related to strength of relationship with the instructor (Sibthorp et al., 2007), though not consistently (Sibthorp & Arthur-Banning, 2004). Outcomes have also been related to participant perception of the quality of group dynamics (Sibthorp et al., 2007), and participants have cited this factor as being important (Goldenberg, Russell, & Soule, 2011).

### **Postcourse Factors**

Lack of aftercare has been identified as a weakness of adventure therapy courses (Gass, Gillis, & Russell, 2012) as well as an issue for nontherapeutic outdoor adventure courses (Leberman & Martin, 2004). Although postcourse reflection has been shown to enhance the use of learning after the course (Leberman & Martin, 2004), few researchers have investigated postcourse factors.

Most of the researchers we have cited base their claims either on participant opinion of what factors are important or on factor effects on course outcomes as measured using participant self-report immediately upon completion of a course. Here, we extend the examination by focusing on the following research question: What factors influence the degree to which outcomes are shown several months after a course as reported by participants as well as by their colleagues?

## **Method**

### **Participants**

The 50 study participants had attended ELDA1 courses that were either 6 or 12 days long (ELDA1 and ELDA2, respectively). ELDA1 courses are designed to improve participants' intra- and interpersonal skills, particularly their ability to perform in stressful situations (which are provided by learning new skills in intense outdoor activities). Irrespective of delivery medium (either whitewater kayaking, rock climbing, mountaineering, or ski touring in each course—students chose which course they would attend), every effort is made to ensure participants are repeatedly placed in challenging situations with real consequences. ELDA1 participants receive peer feedback at the end of a course; in addition, ELDA2 participants also receive information about their reputation via workplace "360 degree" feedback and the Hogan Personality Inventory (Hogan, Hogan, & Warrenfeltz, 2007). Course design is based on the Experiential Learning Cycles detailed by Kolb (1984), with the "concrete experiences" being workplace action (on which participants on ELDA2 courses would receive feedback during the course) and the outdoor element of the course (which the NZALC has decided is the most appropriate medium for leadership learning for soldiers). Typical course structure and execution as well as instructor experience are detailed more fully in Rhodes and Martin (2013).

## Procedure

Fifty course participants were involved in this study. All 71 soldiers who voluntarily participated in the 12 ELDA courses during 2010–2011 initially agreed to participate in the study and completed the End-of-Course questionnaire. An additional level of participation involved participants nominating a colleague with whom they worked reasonably closely to complete a survey about the participant after 8 weeks. The participants and their nominated colleagues were sent the Workplace Follow-Up questionnaire by e-mail 8 weeks after course completion. The consent of nominated colleagues was obtained at this time. Participants and colleagues who initially failed to respond were reminded by phone and/or e-mail, generally 2 and 3 weeks after the initial survey posting (with further reminders if required), to increase return rates. Fifty Workplace Follow-Up questionnaires were received (70% response rate). From the initial study group, 10 soldiers were either deployed overseas or had left the Army during the follow-up period, so they were no longer eligible to participate. Accounting for this attrition gives an effective response rate of 83%. Responses were split between ELDA1 and ELDA2 participants 39:11. Average age was 28 years (range 20–49 years), and 10 participants (20%) were female. Variation in survey return times resulted in a follow-up period ranging from 8 weeks (immediate response) to 44 weeks (i.e., return of survey 36 weeks after survey delivery). We were concerned that individuals with lengthy follow-up periods could confound our analyses, but our investigations for an effect of response time on extent of outcome showed no relationship for any measure (results not presented), so all respondents have been included in all analyses. The average follow-up period was 16 weeks, which included 74% of responses. Because of missing respondents' answers, *n* for predictor variables varies between 37 and 50 participants. Sample size therefore varies for analyses involving these variables. All but one participant agreed to nominate a colleague to complete the observer questionnaire. Thirty-one colleagues returned surveys (effective return rate 82%).

## Measures

The End-of-Course questionnaire was used to obtain information regarding demographic and other precourse factors, and participants' perceptions of during-course factors that may influence workplace outcomes. The Workplace Follow-Up questionnaire was used to measure postcourse workplace outcomes and postcourse factors that may influence outcomes. Both surveys required Likert-type responses (4 to 7 points) and/or written answers. Most factors were assessed using single-item measures, which are acknowledged to be appropriate in some cases (Wanous, Reichers, & Hudy 1997). However, we note they may restrict the utility of our findings in some cases, but the survey length was at a premium to maximize response rates. Outcomes were measured using a retrospective degree-of-change approach (Smither, London, & Reilly, 2005) with multiple items per score.

Given the large number of factors that may affect adventure education course outcomes, we chose to prioritize to keep the survey length to a minimum. We thus hoped to promote a higher survey return rate and higher quality of written answers (Burchell & Marsh, 1992; Galesic & Bosnjak, 2009). First, we assessed only factors that could be manipulated to improve outcomes in the future. Second, we limited our analysis to factors for which empirical evidence existed; that is, we did not include theoretically derived factors. We did, however, include some factors that, although their influence had not been previously shown, had been suggested within the NZALC as likely candidates for manipulation. The final suite of factors included in our analysis, and their derivation, is shown in Table 1.

**Table 1**

*Factors Potentially Affecting Adventure Education Course Outcomes (Derived From Research, or Hypothetical) and Measurement Method Used in This Study*

Category	Factor	Type of variable	Min/max point descriptors <sup>a</sup>
Precourse and Demographic	Age	Ordinal 7 pt	< 19 years – > 54 years
	Gender	Binary	–
	Extent of previous experience in pursuit	Interval	0–60 days (average of 5 days, and 19 participants had no experience)
	% course content that was new to participant	Ordinal 4 pt	0%–100%
	Rank <sup>b</sup>	Ordinal 5 pt	Private/Officer Cadet to Warrant Officer Class 1/ Major
Course Variables	Degree of challenge (fear or frustration) experienced <sup>c</sup>	Ordinal 4 pt maximum score from two descriptor scales	<i>I was never afraid to I was very afraid, most of the time and I was never frustrated to I was very frustrated, most of the time</i>
	Perception of quality of group dynamics	Ordinal 5 pt	<i>I didn't enjoy the group at all to Being part of this group was one of the best aspects of the course</i>
	Rapport with instructors	Ordinal 4 pt	<i>Little or no rapport to Great rapport</i>
	Perceived degree of participant responsibility/decision making	Ordinal 4 pt maximum score from two contributing scales	<i>I had no responsibility to I had considerable responsibility and I had no decision-making opportunities to I had considerable decision-making opportunities</i>
	Degree to which participant could see relevance of course to workplace	Ordinal 5 pt	<i>Not at all relevant to Extremely relevant</i>
	Degree of confidence stated in applying learning from course to workplace	Ordinal 5 pt	<i>Not confident to Extremely confident</i>
	Does participant have a plan to help himself or herself remember to apply what he or she has learned?	Binary	Yes / No

Table 1 (cont.)

Category	Factor	Type of variable	Min/max point descriptors <sup>a</sup>
Postcourse Variables	Frequency with which participant has thought about his or her learning	Ordinal 5 pt	<i>Never since the course to Daily</i>
	Frequency of discussion about course activities with others	Ordinal 5 pt maximum reported from either discussion with nominated colleague or discussion with any other persons	<i>Not at all to Very frequently: consistently more than once a week</i>
	Frequency of discussion about course learning with others	Ordinal 5 pt, as above	<i>Not at all to Very frequently: consistently more than once a week</i>
	Has participant taken action to help himself or herself embed what he or she has learned?	Binary	Yes / No

<sup>a</sup>Descriptors for points other than Min and Max were included in surveys. <sup>b</sup>Rank brackets included soldiers and officers, and rank is a rough surrogate for “time spent in army.” <sup>c</sup>Two variables assessed separately, but collapsed for analysis; maximum indicated in either variable was used.

We measured the presence of course outcomes (the dependent variable) using two main measures for this analysis. First, we used the average change over all learning outcomes as one dependent variable with which to investigate the effect of different factors on participants’ and colleagues’ reports of change. NZALC learning outcomes for the ELDA1 course are

1. control behavior, decision making, and communication under stress;
2. control emotion and reasoning;
3. and learn to apply the psychology of peak performance.

Specific learning objectives for ELDA2 courses, in addition to those mentioned previously, are

1. control behavior, decision making, and communication under stress;
2. to build trust and relationships; and
3. to use networks to achieve influence.

We assessed these outcomes using three to four items per construct. For each item, participants answered the question, “how much better or worse are you at...” with response options *worse, the same as before, a little better, a lot better, and very much better*. Responses were converted to a corresponding –1 to 3 scale. Sample item: “Compared with the 2 months before the course, how much better or worse are you at controlling your mood?” Items for all learning outcomes were averaged to give an overall measure of change in course learning outcomes.

For this article, we also developed generic learning outcomes as a second dependent variable. In addition to capturing a greater range of outcomes, this approach was also designed to be more sensitive (i.e., resulting in more data points) than the “all reported changes” approach we

used in our investigation of course outcomes (Rhodes & Martin, 2013), allowing more nuanced analysis. Six potential outcomes common to ELDA1 and ELDA2 courses were identified by ALC instructors, based on what participants generally experienced in either course:

- managing self-talk in challenging situations;
- understanding and making choices about personal behavior;
- reflecting on performance in challenging situations;
- understanding the importance of, and managing, reputation rather than identity;
- considering the impacts of behaviors on others; and
- understanding the importance of everyday behaviors on leadership presence.

Each construct was measured using three items, and a control question was included for each construct to control for acquiescence bias (Krosnik, 1999).

For each item, participants responded to the question, “to what degree do you [do the following] more or less than you did prior to your ELDA course?” using a 7-point Likert-type scale. Options ranged from *a great deal less than before* (−3), to *about the same as before* (0), to *a great deal more than before* (3; written descriptions were given for all points on the scale, as Krosnik, 1999, suggested). An overall measure of behavior change, Gain, was obtained by averaging responses from all 18 items. Because many of the items within this measure referred to cognition rather than behavior, this part of the questionnaire was administered to participants but not their colleagues. The averages of these items resulted in a scale with a roughly normal distribution.

Respondents were also asked to identify which of seven factors (described in Figure 2) limited the extent to which they applied their learning from the course. There was no limit to the number of factors each participant could choose. This was intended to amplify the main study question (What factors influence the degree to which outcomes are shown?) by also asking, what are participants’ conscious reasons for not showing any outcomes?—a question we have not seen addressed in the literature.

## Statistical Analysis

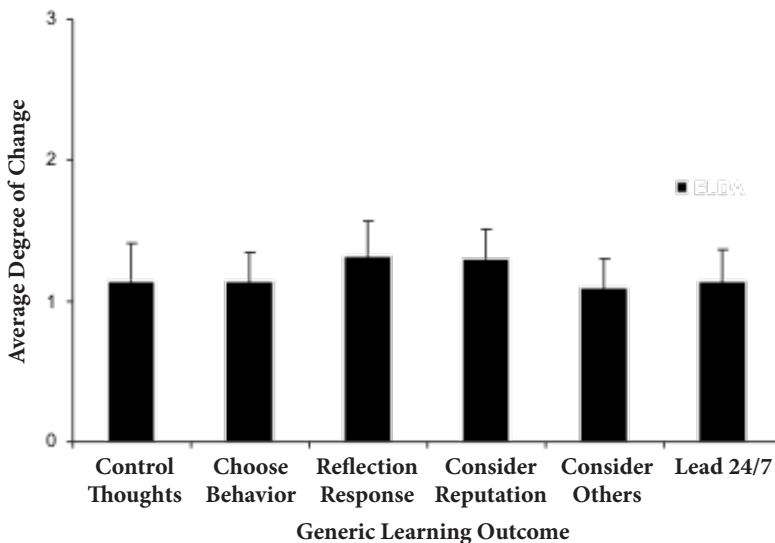
Cronbach’s alpha was calculated to assess internal consistency for items in scales contributing to the overall Gain score and individual learning outcomes, using Statistical Package for the Social Sciences (SPSS 11.0.0). Alpha scores ranged between 0.606 and 0.833 for Gain scores and between 0.556 and 0.845 for official course learning objectives. Because the items used for the latter were the descriptors from the Army Leadership Framework (New Zealand Army, 2007), and all of these descriptors were assessed as published, we accepted that although the calculations of alpha are generally low (for both scales), all scores lie above the unacceptable cutoff for consistency (Kline, 1999).

Because of our small sample size and highly correlated predictor variables (both of which prevented the use of various multivariate statistical methods), we used Spearman’s nonparametric correlations to assess the factor–outcome relationships. We did not correct probability values to account for multiple tests because with a relatively small sample size, and therefore relatively low power, we did not want to further inflate our chance of Type II errors (Nakagawa, 2004). The purpose of this study was to alert practitioners to variables that, if developed, may improve outdoor education outcomes; the risks associated with falsely including variables as significant seem at this stage to be minor. However, we remind the reader to interpret the correlation coefficients (standardized effect sizes) as well as the *p*-values for a better understanding of the effects of the variables discussed.

## Results

### Change in Generic Learning Outcomes: Participant Self-Report

Most respondents indicated positive changes in their behavior and attitudes in regard to the six generic learning outcomes. Average change for each desirable outcome was roughly 1 on the 3-point scale, or “I do this a little more than I used to” (Figure 1), with responses ranging from “No change” to “I do this a great deal more than before” for almost every outcome. There was no difference in the average change over all six outcomes,  $F(5, 294) = 0.650, p = 0.661$ . The average response over all desirable outcomes, Gain ( $M = 1.23, SD = 0.7, \text{kurtosis} = -0.6, \text{skewness} = 0.4$ ), was significantly more positive than the average for control questions ( $-0.30$ ),  $t(44) = 10.72, p < 0.001$ ; five surveys were missing data for control questions). Gain ranged from 0 to 2.9 on the  $-3$  to 3 scale.



**Figure 1.** Degree of change in generic learning outcomes reported by participants, comparing before to after their attendance on an ELDA course.

### Change in Army Leadership Framework Learning Objectives: Participant Self-Report and Colleague Observations

Degree of change was similar to that shown in the generic learning outcomes, averaging roughly 1, or just under *a little better*, for each of the three learning outcomes. The average change over all learning outcomes, AVE L.O., ranged between 0 and 2.4 on the available  $-1$  to 3 scale ( $M = 0.94, SD = 0.56, \text{skewness} = 0.43, \text{kurtosis} = -0.62$ ).

Colleague reports of observed change in learning outcomes were, on average, lower than those by their paired ELDA1 participants but were not significantly different to those given by their paired ELDA2 participants (Rhodes & Martin, 2013). The average change score over all learning outcomes (possible:  $-1$  to 3) ranged from 0 to 2.08 among all 31 colleagues ( $M = 0.69, SD = 0.54, \text{kurtosis} = 0.38, \text{skewness} = 0.71$ ).



## Precourse Factors

None of the five precourse variables were significantly related to Gain (the overall degree of participants' reported improvement in generic learning outcomes; strongest correlation  $\rho = -0.234, p = 0.117$ ). Neither were they related to the average change in learning outcomes, either as reported by participants or as seen by colleagues.

## During-Course Factors

Participant perceptions of rapport with instructors and of quality of group dynamic showed notable ceiling effects, so they were excluded from the analysis (*sensu* Sibthorp, 2003). Significant positive correlations were found between Gain and four of the six remaining course variables investigated:

- perceived relevance of learning to the workplace,
- having a plan to help remember learning,
- level of fear/frustration experienced during course, and
- overall satisfaction with course (Table 2).

Correlations with average change in learning outcomes as reported by participants affirmed these first relationships, though correlation coefficients were slightly lower in all cases (Table 2). Additionally, the degree of confidence in applying learning to the workplace was also positively related to average change in learning outcomes. This was also positively correlated with average change in learning outcomes as reported by colleagues ( $\rho = 0.325$ , Table 2). Of the six during-course variables assessed, the degree of fear/frustration reported by participants was most strongly related to any outcome ( $\rho = 0.416$ ).

## Postcourse Factors

All four postcourse variables were related to at least one of the outcome measures (Table 3). In regard to the Gain scores shown by the participants, there were positive relationships with

- having taken action to help apply course learning,
- the frequency with which course learning (but not activities) had been discussed since the course, and
- the frequency with which course learning had been thought about since the course (Table 3).

Average changes in course learning outcomes were not related to the first factor that was relevant for Gain scores (having taken action to help apply learning) but showed similar relationships to the other variables (Table 3). Colleagues' perceptions of change in the course learning outcomes showed similar relationships to the predictor variables as those shown by participants' claims of change, except a positive relationship was found between colleague perceptions of change in learning outcomes and the degree to which participants discussed the course activities since the course (although discussion of course activities was not related to the degree of change the participants reported).

Nearly half the participants (23) reported that no factors limited the extent to which they applied their learning from the course. The most common factor among the remaining participants was "I haven't been thinking very much about what I learned" (11 participants, or 22%). Other commonly cited factors were "The situation on the course is too different to my workplace," "I haven't yet had any opportunities," and "What I learned on the course doesn't apply in my workplace" (Figure 2).

**Table 2**  
*Correlations Between Overall Changes in Behavior/Attitudes (Gain) and Course Variables*

Course variable	Participant degree of change rating				Colleague degree of change rating			
	Correlation with Gain		Correlation with AVE L.O.		Correlation with AVE L.O.			
	Spearman's $\rho$	$p$	Spearman's $\rho$	$p$	Spearman's $\rho$	$p$	Spearman's $\rho$	$p$
Perceived relevance of learning to workplace	.39	.02**	.31	.03**	.37	.12	.58	.23
Confidence in applying learning to workplace	.13	.39	.26	.08*	46	.33	.09*	28
Have a plan to help remember learning	.34	.02**	.31	.04**	46	.01	.96	28
Level of perceived responsibility/decision making	.24	.10	.14	.35	46	.23	.23	28
Level of fear/frustration	.42	.004***	.36	.02**	46	.14	.49	28
Overall satisfaction with course	.33	.03**	.31	.04**	45	.21	.28	28

Note. AVE L.O. = average change over all learning outcomes.

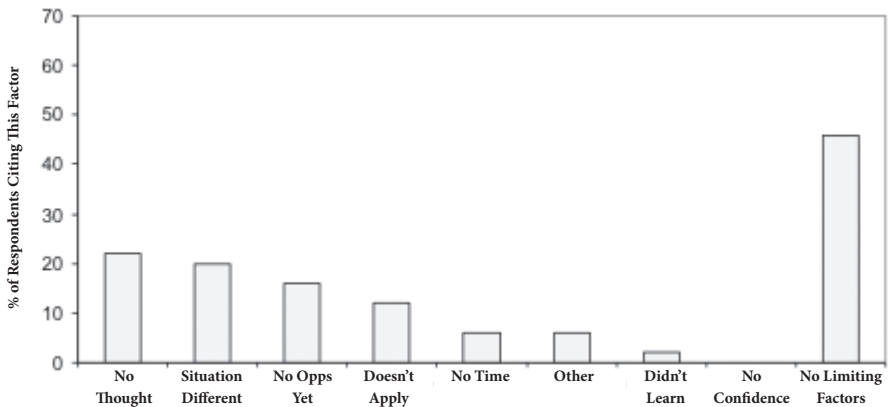
\* $p \leq 0.1$ . \*\* $p \leq 0.05$ . \*\*\* $p \leq 0.01$ .

**Table 3**  
*Correlations Between Overall Positive Changes in Behavior/Attitudes (Gain) and Postcourse Variables*

Course variable	Participant degree of change rating				Colleague degree of change rating			
	Correlation with Gain		Correlation with AVE L.O.		Correlation with AVE L.O.			
	Spearman's $\rho$	$p$	Spearman's $\rho$	$p$	Spearman's $\rho$	$p$	$n$	
Taken action to embed their strategies	.20	.04**	.13	.37	.19	.57	30	
Frequency of discussing course activities (e.g. kayaking)	.19	.19	.16	.28	.42	.02**	30	
Frequency of discussing course learning	.47	.001***	.39	.005***	.38	.04**	30	
Frequency of thinking about course learning	.53	<.001***	.40	.004***	.31	.10	30	

Note. AVE L.O. = average change over all learning outcomes.

\* $p \leq 0.1$ . \*\* $p \leq 0.05$ . \*\*\* $p \leq 0.01$ .



**Figure 2.** Factors limiting the extent to which participants applied their course learning to their workplace.

## Discussion

### Precourse Factors

Although the precourse factors we assessed have previously been found to be influential in at least some studies, our results support those from Conrad and Hedin's (1982) research in which antecedent factors explained little variance in participant development. However, we remind the reader that failure to show a significant relationship is not evidence that such a relationship does not exist. This is particularly important with regard to the degree of prior experience in the pursuit (previously found significant by Sibthorp et al., 2007). Instructors in this study worked hard to ensure that course participants were challenged irrespective of their prior experience; the high instructor–student ratio helped make this possible. Without this challenge, it seems likely that some of the conditions for effective outdoor adventure education (e.g., Walsh & Golins, 1976) would not be met. For these reasons, despite our finding of no significant relationship, the NZALC now streams soldiers into activities with which they are unfamiliar to maximize inherent opportunities for challenge and growth.

### During-Course Factors

The significant positive relationship between the degree to which participants understood the relevance of the course at course completion and the degree to which they then reported changes in learning outcomes affirms previous research (e.g., Sibthorp & Arthur-Banning, 2004). The underlying mechanism driving this relationship could be an initial expectation for personal change as a result of the course (Sibthorp, 2003), which we were unable to measure because we did not use a precourse survey. Having acknowledged that understanding relevance may not be the causal factor in the relationship, it remains that promoting understanding could improve subsequent workplace outcomes. Additionally, two of the four most frequently mentioned reasons for not having applied course learning in the workplace (“The situation on the course is too different to my workplace” and “What I learned doesn't really apply in my workplace” [Figure 1]) further point to a lack of understanding of course relevance among some participants acting as a barrier to application of learning. Similarly, the apparent positive effects of confidence in applying learning and having a plan to help remember learning may also not be causal. However, there are few costs in ensuring participants are equipped to apply their course learning and in

having participants establish their own reminders, so we suggest these may be useful practices to promote postcourse adoption of learning.

One significant during-course factor to which causality can be attributed is the degree to which participants reported experiencing challenge by fear or frustration. It is extremely unlikely that any underlying factor can explain why students might be more likely to feel challenged as well as why they might change their thoughts and behavior to a greater degree after the course. Additionally, a reverse relationship is impossible as behaviors reported 4 months after the course cannot possibly affect the degree of challenge reported at course end. We found participants who perceived greater challenge during their course showed, on average, greater workplace outcomes after their course. This is in line with participant perception that being challenged is an important during-course component (e.g., D'Amato & Krasny, 2011; Goldenberg et al., 2011) and previous links between degree of challenge and course outcomes (Sibthorp et al., 2007).

It appears that fear and/or frustration may be particularly important for achieving the objectives of ALC courses, which include significant elements of dealing with pressure. It is also likely the activities invoking fear and frustration in this study also provide emotional intensity, consequentiality, and opportunities for peak performance, all of which have been cited as important for successful outdoor management development courses (McEvoy & Buller, 1997). Because the NZALC uses pressure in the outdoors as a surrogate for likely pressure in an operational environment, and because this evaluation shows challenge to be an important predictor of workplace outcomes, the NZALC will continue to focus on creating stressful situations for participants through perceived fear and frustration in the learning process (note that frustration with the course itself is something to be avoided). We acknowledge the apparent discord with the widely-accepted inverted *U* model for the relationship between peak performance and arousal (Yerkes & Dodson, 1908), but point out that we are not disputing the inverted *U*. First, our interest is not in peak performance of the activity as addressed in the model, but rather in long-term behavior and attitude change no matter what the level of performance had been; that is, potentially the model is not even applicable in this case. Second, we suspect that even if the *U* still applies to long-term learning (i.e., overarousal or being overchallenged could result in less subsequent behavior or attitude change), we suspect that we have only documented data from students on the increasing outcome side of the curve. Participation in activities was always voluntary and students could elect not to participate (not climb, walk a rapid, etc.) at any stage. So the students would control the experience of being overchallenged. This is likely an essential concept to remember when applying our "maximize challenge for maximal outcomes" rule.

Given the perceived importance of empowering course participants (e.g., Shellman & Ewert, 2010), including increasing autonomy by allowing participants responsibility and decision making, we were somewhat surprised that no outcome showed a relationship with this measure in our evaluation. Finally, participant satisfaction at the conclusion of the course was a significant predictor of both generic learning outcomes (Gain) and official learning outcomes. Other described variables may well account for the variance explained by satisfaction (i.e., participants who have experienced more challenge and can see course relevance to the workplace are likely to feel more satisfied at course end). However, it seems likely that participants who, for whatever reason, are less satisfied with the course are also less likely to change their behaviors as a result. We expect that striving to achieve participant satisfaction is indeed important not only for positive emotions at course end, but also for promoting subsequent adoption of learning.

## Postcourse Factors

Degree of workplace outcomes reported was positively correlated with participant reports of having taken action to apply their learning, having discussed their course learning more fre-

quently, and thinking about course learning more frequently in the period since the course. Although the conclusion that promoting discussion and reflection on learning after the course will likely increase application of learning makes intuitive sense, these correlations suffer the same issue of questionable causality. However, there is further evidence these factors are worth considering. First, the interesting lack of correlation with frequency of discussing course activities indicates that to apply learning, a person needs to remember the learning, not the learning context. Second, the reason most frequently given by participants to explain their lack of applying learning in the workplace was *I haven't been thinking about my learning* (Figure 1), again indicating that strategies to remind them of their learning (i.e., actions to apply their learning, discussion of course learning, or any other strategy to increase reflection on learning, i.e., the three promoting factors already identified) could improve course outcomes.

## Factors Affecting Colleague Perception of Change

Assessing factors for their ability to influence colleague perceptions of change is a novel concept. Presumably, factors that can exert their influence to the degree that others notice are worthy of our attention when designing and delivering adventure programming. Even though we focused on factors that have previously been shown to have significant relationships with immediate course outcomes, and many of these factors proved to be significant for postcourse (4-month follow-up) outcomes in this study, few remained significantly related to colleague perceptions of change. Possibly those that were significant (the postcourse factors of frequency of discussion—both of learning and of course activities—and the during-course factor confidence in applying learning, which approached significance) are worth focusing on. Colleague perceptions of change were related to discussion of activities as well as of learning, whereas participant perceptions of change were related to discussion of learning only, and this may simply demonstrate that discussion of either made the colleagues more likely to notice changes (rather than that discussion of either made people more likely to demonstrate changes). It remains, however, that promoting participants' remembering of their learning after the course (which was a consistently important predictor of participants' claims of change, and approached significance as a predictor for colleagues' observations of change) is likely an important way of increasing the efficacy of a course for later behavior change. Similarly, boosting participants' confidence in applying their learning from the course (which was an important predictor of participants' claims of change as well as colleagues' noticing of change) is also likely an important part of making a course effective.

We acknowledge the use of a sample from this army context may present issues of systematic bias when compared to a general population. Our use of course-specific outcome measures may also limit the degree to which results can be generalized to other courses. However, our measures are similar to scales in the widely-used Life Effectiveness Questionnaire (Neill, Marsh, & Richards, 2003), so they should still provide interpretable data.

## Conclusions

This study opens up the possibility of understanding moderating factors through observer assessments of change. Through this study, a number of factors already thought to be influential in outdoor adventure programming for personal development outcomes are affirmed, and it extends relationships into workplace outcomes instead of simple end-of-course measures. We suggest that postcourse workplace outcomes may be enhanced by making every effort to ensure that participants

- are challenged during their course (from our findings, challenge was found through fear or frustration; practitioners will need to find methods of challenging their students that are appropriate for those students);

- understand the relevance of the course and how to apply their learning to the work-place; and
- have mechanisms and strategies in place after the course to reinforce their learning (e.g., simply reminding them) and to encourage further reflection.

We acknowledge that being unable to identify which of the predictor variables may be truly driving the changes seen is a significant limitation of our study. However, we surveyed participants at least several months past the course and involved their colleagues' opinions as well (so it is not simply based on self-report). We recommend that in future studies researchers address which of the factors drives the relationships presented here.

## References

- Burchell, B., & Marsh, C. (1992). The effect of questionnaire length on survey response. *Quality and Quantity*, 26, 233–244. <http://dx.doi.org/10.1007/BF00172427>
- Cason, D., & Gillis, H. L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *Journal of Experiential Education*, 17, 40–47. <http://dx.doi.org/10.1177/105382599401700109>
- Conrad, D., & Hedin, D. (1982). *Experiential education evaluation project: Final report*. St. Paul: University of Minnesota, Center for Youth Development Research.
- D'Amato, L. G., & Krasny, M. E. (2011). Outdoor adventure education: Applying transformative learning theory to understanding instrumental learning and personal growth in environmental education. *Journal of Environmental Education*, 42, 237–254. <http://dx.doi.org/10.1080/00958964.2011.581313>
- Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length of participation and indicators or response quality in a web survey. *Public Opinion Quarterly*, 73(2), 349–360. <http://dx.doi.org/10.1093/poq/nfp031>
- Gass, M. A., Gillis, H. L., & Russell, K. C. (2012). *Adventure therapy: Theory, research and practice*. New York, NY: Routledge.
- Goldenberg, M. (2002). *Understanding the outcomes of outdoor adventure experiences using means-end analysis* (Unpublished doctoral dissertation). University of Minnesota, Twin Cities, MN.
- Goldenberg, M., Russell, K. C., & Soule, K. (2011). Comparing Outward Bound and National Outdoor Leadership School participant experiences. *Journal of Experiential Education*, 33, 360–364. <http://dx.doi.org/10.1177/105382591003300407>
- Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure education and Outward Bound – Out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67, 43–87. <http://dx.doi.org/10.3102/00346543067001043>
- Hogan, R., Hogan, J., & Warrenfeltz, R. (2007). *The Hogan guide: Interpretation and use of inventories*. Tulsa, OK: Hogan Assessment Systems.
- House, J. D. (1995). The predictive relationship between academic self-concept, achievement expectancies, and grade performance in calculus. *The Journal of Social Psychology*, 135, 111–112. <http://dx.doi.org/10.1080/00224545.1995.9711411>
- Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London, England: Routledge.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, N.J.: Prentice Hall.
- Krosnik, J. A. (1999). Survey research. *Annual Review of Psychology*, 50, 537–567. <http://dx.doi.org/10.1146/annurev.psych.50.1.537>
- Leberman, S. I., & Martin, A. J. (2004). Enhancing transfer of learning through post-course reflection. *Journal of Adventure Education and Outdoor Learning*, 4(2), 173–184. <http://dx.doi.org/10.1080/14729670485200521>

- Leberman, S. I., & Martin, A. J. (2003). Does pushing comfort zones produce peak learning experiences. *Australian Journal of Outdoor Education*, 7(1), 10–19.
- McEvoy, G., & Buller, P. (1997). The power of outdoor management development. *Journal of Management Development*, 16, 208–217. <http://dx.doi.org/10.1108/02621719710164355>
- McKenzie, M. D. (2000). How are adventure education program outcomes achieved? A review of the literature. *Australian Journal of Outdoor Education*, 5, 19–28.
- McKenzie, M. (2003). Beyond 'The Outward Bound Process': Rethinking student learning. *Journal of Experiential Education*, 26, 8–23. <http://dx.doi.org/10.1177/105382590302600104>
- Nakagawa, S. (1994). A farewell to Bonferroni: The problems of low statistical power and publication bias. *Behavioural Ecology*, 15, 1044–1045. <http://dx.doi.org/10.1093/beheco/arh107>
- Neill, J. T., Marsh, H. W., & Richards, G. E. (2003). *The Life Effectiveness Questionnaire: Development and psychometrics*. Sydney, Australia: University of Western Sydney.
- New Zealand Army. (2007). *New Zealand Army leadership manual*. Wellington, New Zealand: Author.
- Rhodes, H., & Martin, A. J. (2013). Professional development after adventure education courses. Do work colleagues notice? *Journal of Experiential Education*, 37, 265–284. <http://dx.doi.org/10.1177/1053825913503115>
- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice? *Psychological Science in the Public Interest*, 13, 74–101. <http://dx.doi.org/10.1177/1529100612436661>
- Shellman, A., & Ewert, A. (2010). A multi-method approach to understanding empowerment processes and outcomes of adventure education program experiences. *Journal of Experiential Education*, 32, 275–279. <http://dx.doi.org/10.1177/105382590903200310>
- Sibthorp, J. (2003). An empirical look at Walsh and Golins' adventure education process model: Relationships between antecedent factors, perceptions of characteristics of an adventure education experience, and changes in self-efficacy. *Journal of Leisure Research*, 35, 80–106.
- Sibthorp, J., & Arthur-Banning, S. (2004). Developing life effectiveness through adventure education: The roles of participant expectations, perceptions of empowerment, and learning. *Journal of Experiential Learning*, 27, 32–50. <http://dx.doi.org/10.1177/105382590402700104>
- Sibthorp, J., Paisley, K., & Gookin, J. (2007). Exploring participant development through adventure-based programming: A model from the National Outdoor Leadership School. *Leisure Sciences: An Interdisciplinary Journal*, 29, 1–18. <http://dx.doi.org/10.1080/01490400600851346>
- Smither, J. W., London, M., & Reilly, R. R. (2005). Does performance improve following multi-source feedback? A theoretical model, meta-analysis, and review of empirical findings. *Personnel Psychology*, 58, 33–66. [http://dx.doi.org/10.1111/j.1744-6570.2005.514\\_1.x](http://dx.doi.org/10.1111/j.1744-6570.2005.514_1.x)
- Walsh, V., & Golins, G. (1976). *The exploration of the Outward Bound process model*. Denver, CO: Colorado Outward Bound School.
- Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single item measures? *Journal of Applied Psychology*, 82, 247–252. <http://dx.doi.org/10.1037/0021-9010.82.2.247>
- Yerkes, R. M., & Dodson, J. D. (1908). The relations of strength stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18, 459–482. <http://dx.doi.org/10.1002/cne.920180503>