
A Project Hahn empirical replication study

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Abstract

The current study investigated affective and cognitive outcomes at pre, post and follow-up of 79 male and female Project Hahn wilderness program participants referred to the program through various agencies involved with employment, education, justice and welfare. The recurrent institutional design and selection of measures were based on an earlier empirical study by Sveen and Denholm (1997). Major findings include significant long-term effects reflecting greater participant self-actualisation (ES of .49) and decreased hopelessness (ES of .55). There was a more transitory increase in existential wellbeing. Police recidivist data indicated that 42 of 56 youth who had prior convictions did not re-offend in the two years following the wilderness intervention. Of 23 youth without prior convictions, 8 received convictions in this period. Overall, the study supports the continuing value of wilderness programs for at-risk youth.

Well-conducted empirical outcome research is rare in the field of outdoor education and experiential learning. The literature indicates that the current understanding of adventure education outcomes is based largely on theory rather than empirical research (McKenzie, 2000). Even more rare is replication research of empirical studies, a key point in empirically supported treatments (Newes, 2001). A critical task for research is to establish the relative efficacy of adventure programs. As Neill (2003) suggests, a comparison of a program's effect sizes with meta-analytic benchmarks will provide useful comparative information about program efficacy. On the basis of this brief, this paper will attempt to demonstrate the use of an empirical program evaluation to offer more robust evidence of the psychological benefits of wilderness programs, and how the replication process using refined research techniques also leads to more accurate and comparative judgements about changes in participants' wellbeing.

The original study

Sveen (1995; Sveen & Denholm, 1997) investigated Project Hahn, a wilderness program for adolescent offenders and others at risk of such behaviours, using the Recurrent Institutional Design (RID). Campbell and Stanley's (1966) quasi-experimental recurrent institutional cycle design was chosen as the most suitable design for this type of study due to its application to situations where a given aspect of an institutional process is on a cyclical schedule, continually being presented to a new group of respondents. The recurrent institutional research design combines the longitudinal (i.e., post- minus pre-scores - growth-oriented) and the cross-sectional (i.e., first group post minus the following group scores - behaviour difference) approaches commonly employed in developmental

research. Campbell and Stanley (1966) recommend creating experimental and control groups from among self-selected participants in novel programs by manipulating waiting periods.

The Sveen and Denholm (1997) investigation was rigorous in that qualitative and quantitative aspects of Project Hahn were examined from a theoretically driven methodology aimed at the causes of adolescent risk (Dryfoos, 1990). From qualitative observational data, Sveen presented evidence suggesting Project Hahn could be conceptualised into the various components and aspects of a theoretical eclectic model (Walter & Marks, 1981). He then proceeded to perform a quantitative analysis measuring program efficacy at post and follow-up program stages using measures that corresponded to aspects of the eclectic theoretical model. Instruments included measures of social, personal and general self-esteem (The Culture Free Self Esteem Inventory - CFSEI) (Battle, 1992), self-actualisation (Self Actualisation Index - SAI) (Jones & Crandall, 1986), and body shape acceptance (Body Attitude Scale - BAS) (Rosen & Ross, 1968). Behavioural measures of education, employment and recidivism were also included.

Sveen (1995) found significant gain score differences between the treatment and control groups in the psychometric areas of general self-esteem and self-actualisation. Further, transference of learning to the community resulted in 68% of participants making gains in education and employment, with 88% fewer secondary offences (309 fewer offences leading to conviction in the year following the program than in the year before). Gender differences suggested that males made long-term gains in the areas of general and personal self-esteem, while female participants made short-term gains

in social self-esteem (new peer relationships) and self-actualisation (personal insights). Sveen (1995) concluded that the physical demands chosen to accommodate both genders assisted female adolescent participants in gaining a more accurate and positive understanding of their social and personal attributes and abilities. Adolescent males appear to begin the program with an overestimation of their physical selves. Post-activity loss of bravado occurs amongst male peers, potentially signalling a less competitive atmosphere and possible opportunity for development of self.

Project Hahn Wilderness Program

Project Hahn Wilderness Program (Tasmania) is one of the longest continually running Outward Bound derivative programs in Australia (established 1983), providing intervention for youth older than 15 years who are at risk of not making a healthy transition from adolescence into adult life. Not all program participants have initiated at-risk behaviours; however, for many of the participants, their demographic, personal, and social characteristics place them at risk of undesirable circumstances such as truancy, school refusal, alcohol and drug addiction, suicide, depression, unlawful behaviour, physical self-harm, social marginalisation, and disempowerment. The program seeks to reduce participants' risk by providing opportunities for maturational gain and personal development through experiential group-based counselling techniques that use novel outdoor activities within the milieu of the wilderness (Adams & Sveen, 2000). The program acknowledges the contribution of previous and future interventions (adjunctive approaches), and sees its role as a catalyst or nexus for maturational gains, thus helping to accelerate and (for some) revisit adolescent developmental processes.

Method

Participants

The criteria for inclusion in the present replication study were that participants were aged above 13 years, were considered at risk by the referral agency, and were able to monitor personal and others' levels of safety during the activities. Initial referral to the program was made through private and public employment, education, justice and welfare agencies. The majority of participants were from school settings. There was a 2:1 male-female ratio, with most participants aged between 13-15 years of age. Participant data steadily decreased at each stage of data collection (pre n = 79; post n = 61; follow-up n = 34). They were especially low at follow-up (43%) as transitory participants

became less contactable and did not respond to letters.

Instruments

Instruments used in the study were chosen to cover several factors:

1. Instruments had to relate to the various theoretical perspectives of the eclectic model.
2. The instruments collectively had to be easy to administer, easy to understand, and completed within 15 minutes in order to meet the participant attention, motivation and comprehension abilities.
3. Instruments needed to provide some basis for comparison with findings in previous research on Project Hahn by Sveen (1995), with a view to either confirm or disconfirm findings of that study.
4. Instruments had to be psychometrically reliable and demonstrate validity in population appropriate settings.

The final measures chosen based on these criteria were: Culture Free Self Esteem Inventory (CFSEI) (Battle, 1992), the Self Actualisation Inventory (SAI) (Jones & Crandall, 1986) from the original study, the Existential Well Being Index (EWB) (Polutizian & Ellison, 1982), and the Beck Hopelessness Scale (BHS) (Beck & Steer, 1988). The EWB and BHS were chosen to improve the measuring of multiple theoretical constructs underpinning the eclectic model (Sveen, 1995; Sveen & Denholm, 1997). The EWB is a subscale of the Spiritual Well-being Scale designed to measure perception of one's life purposes and an attitude of satisfaction. Test-retest reliability has ranges of .86 to .96 (Thomason & Brody, 1999). The BHS revolves around three factors: *loss of motivation* (giving up or self-denial); *feelings about the future* (hope, enthusiasm, faith and good times); and *future expectations* (dark future, negative explanations, a vague and uncertain outlook) (Katz, Katz & Shaw, 1999; Steer, Kumar & Beck, 1993). Katz et al. (1999) report the BHS test-reliability was reasonable (.69) and validity studies suggest the BHS also has a strong association with suicide intent and actual suicide completion.

The survey also included qualitative open-ended questions about the positive/negative/best aspects of the wilderness program, recommended changes to the program, changes upon returning home, and behavioural data.

Procedure

Participants gave consent to participate in the evaluation of Project Hahn by completing a survey at the pre (day 1), post (day 6), and

follow-up stage (30+ days) of the wilderness program course. Programs involved taking participants to remote wilderness areas for the duration of 6 days to complete various challenging outdoor activities. If a group came to a consensus, participants were able to terminate the course at any time (two groups terminated prematurely). Two facilitators were present in each group (and often an instructor-in-training); they were responsible for organising and discussing activities, and for challenging and processing adolescents' thoughts, actions and verbalisations on the course. A requirement of the course was for participants to generate a personal goal to work towards (sometimes the goal was modified later in the program to reflect in-depth awareness), and to follow group rules for safety. Following course completion, participants returned to their communities and later received a report about their participation on the wilderness course to assist in an adjunctive process with their referral agents.

Using standardised instructions, program facilitators administered the surveys at pre and post stages; this included an introduction about what the evaluation entailed and some recording of identifying information. Instructions and items of each instrument were read out aloud by the facilitator to compensate for participant literacy difficulties. Follow-up data were collected after participant self-administration with the option of gaining the help of a trusted adult if necessary. Participants were encouraged to mail results back by pre-paid envelopes; numerous telephone calls, the occasional visit, and even the referral agent was enlisted to encourage return.

Design

The Project Hahn participants were self-selecting volunteers who were not randomly chosen in this study. As noted earlier, Project Hahn operates on a small group of participants (a cohort) in a cyclical manner. A cohort completes the wilderness program, exits, and then a cohort of new participants completes the program, exits, and so on. The RID takes advantage of this cycle and uses each new cohort as a control group for the previous cohort. This is done by comparing the post

scores of the cohort that has just finished with the pre scores of the new cohort that is to begin. If it can be consistently shown in the cycle that the post scores of previous cohorts are significantly higher than the pre scores of the subsequent cohorts, then it may be argued that score changes are due to program intervention, rather than measurement error and differences between cohorts. This is called the cross-sectional comparison. Although not as empirically sound as randomly assigned subjects (Newes, 2001), the advantages of this design over the simple pre-test/post-test analysis is that more control over the extraneous variables of history, maturation, selection and testing is achieved.

Results

The data collected at pre-test, post-test and follow-up were analysed to assess changes resulting from exposure to the program. The effect on total self-esteem in the Culture Free Self Esteem Inventory was marginal, and there were no systematic effects for the subscales or the lie scale. Thus only the results for total self-esteem will be presented in detail. Descriptive statistics for total self-esteem, self-actualisation, existential wellbeing, and hopelessness are presented in Table 1.

Paired *t*-tests for the longitudinal comparisons and independent groups *t*-tests for the cross-sectional comparisons in accordance with the Recurrent Institutional Design are shown in Table 2. Cohen's *d*, based on the Recurrent Institutional Design in which the post-test scores from one cohort are compared with the pre-test scores from the following cohort. * $p < .05$. ** $p < .01$ (Cohen, 1992).

As Table 2 shows, there are significant long-term effects reflecting greater self-actualisation and decreased hopelessness. The corresponding effect sizes are medium in terms of Cohen's *d* (Cohen, 1992). These effects are evident in both the longitudinal and cross-sectional analyses. The corresponding effects for total self-esteem and existential wellbeing are small, but in the predicted direction. They do not achieve statistical significance.

Table 1: Descriptive statistics for Total Self-Esteem, Self Actualisation, Existential Wellbeing, and Hopelessness

	Pre-test			Post-test			Follow-up		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Total self esteem	18.30	6.48	79	18.98	7.85	62	20.31	7.31	35
Self Actualisation	41.21	5.93	77	42.05	6.57	62	44.16	5.49	35
Existential Wellbeing	28.19	6.41	75	30.79	6.68	61	29.77	6.20	35
Hopelessness	6.57	4.27	77	5.49	4.55	61	3.97	4.57	33

Table 2: t-tests and Power estimates for the longitudinal and cross-sectional comparisons of means between pre-test, post-test and follow-up

	Longitudinal Comparisons			Cross-sectional Comparisons			Effect Size ^a
	<i>df</i>	<i>t</i>	Power	<i>df</i>	<i>t</i>	Power	<i>d</i>
Pre vs Post							
Total self esteem	60	1.38	.27	128	0.49	0.08	0.09
Self Actualisation	58	0.89	.14	126	0.47	0.07	0.08
Existential Wellbeing	57	3.02**	.84	123	2.16*	0.57	0.39
Hopelessness	58	2.52*	.70	125	1.25	0.24	0.22
Post vs Follow-up							
Total self esteem	27	2.17*	.55	89	0.74	0.11	0.16
Self Actualisation	27	2.67*	.73	89	1.32	0.26	0.28
Existential Wellbeing	26	0.17	.05	88	0.72	0.11	0.16
Hopelessness	26	2.97**	.82	86	1.50	0.32	0.33
Pre vs Follow-up							
Total self esteem	33	2.26*	.59	106	1.29	0.25	0.26
Self Actualisation	33	2.70*	.75	104	2.36*	0.65	0.49
Existential Wellbeing	33	0.70	.10	102	1.11	0.20	0.23
Hopelessness	31	4.47**	.99	102	2.64**	0.74	0.55

There is a noticeable short-term improvement in existential wellbeing, probably reflecting the wilderness experience. Because of the drop-out from pre-test to post-test and follow-up, a Missing Values Analysis was performed to check that those who dropped out were not systematically different on any of the primary measures from participants who participated in the full data collection. The analysis consisted of *t*-tests comparing the mean pre-test scores of participants who provided scores at post-test and follow-up with the corresponding mean pre-test scores of those who had dropped out at that stage.

Descriptive and inferential statistics are presented in Table 3. As shown in Table 3, the pre-test means and standard deviations of the various measures are quite similar between those who remained in the study and those who dropped out at post-test or at follow-up. None of the *t*-tests of difference between means approached statistical significance. It may be concluded that there are no systematic biases involving the key measures that may have resulted in improvement as an artifact of loss of participants over the course of the study.

Table 3: Statistics for the Missing Values Analysis to assess differences in mean pre-test scores for those who did and did not drop out at post-test and follow-up

	Present			Missing			<i>t</i> -test		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>df</i>	<i>t</i>	<i>p</i>
Total self esteem									
Post-test	17.80	6.40	61	20.00	6.66	18	77	1.27	.21
Follow-up	17.29	6.07	34	19.07	6.74	45	77	1.21	.23
Self Actualisation									
Post-test	41.17	5.67	59	41.33	6.91	18	75	0.10	.92
Follow-up	41.74	5.89	34	40.79	6.00	43	75	0.69	.49
Existential Wellbeing									
Post-test	28.30	6.19	58	27.79	7.30	17	73	0.29	.78
Follow-up	28.79	6.13	34	27.68	6.67	41	73	0.75	.46
Hopelessness									
Post-test	6.39	4.12	59	7.17	4.81	18	75	.67	.50
Follow-up	7.09	4.45	32	6.20	4.14	45	75	.90	.37

Recidivist data

Police recidivist data were obtained pre-program and for two years post-program. It was found that 64 of the 79 participants (male 48/74%, female 16/24%) had prescribed convictions under Youth Justice Act (Tasmania) 1997 (i.e., Commonwealth Crimes Act convictions and matters of a more serious nature) before and after Project Hahn participation. Fifty-six youth had convictions prior to participation in Project Hahn. The former participants have been categorised into three groups:

1. Those individuals (42) with prior convictions who did not have any further convictions after treatment.
2. Those individuals (14) with prior convictions who do have further convictions after treatment.
3. Those individuals (8) with no prior convictions who have further convictions after treatment.

Those participants referred through the Salvation Army Bridge Alcohol and Drug Treatment Centre had the highest level of offending prior to the program (57 previous offences) and not re-offending following the program. There seems to be a powerful treatment effect on offending behaviour through the combining of Bridge (A&D) and Project Hahn (wilderness processes). This relationship needs to be studied further.

Qualitative reflections

The transitory increase in existential wellbeing has already been noted, as well as longer-term improvements in hopelessness and self-actualisation. These changes are expressed by participants in the following comments:

... aware that I can be me, who I am, and (I can be) be liked and respected. I am able to take a sense of spirituality and purpose into my daily life.

I've found the real me...

... confirming my faith in humanity and the amazing potential of the individuals in the group.

A majority of participants' comments at post-course were vague positive affective statements. At follow-up, responses retained their positive affect, but much of the vagueness of participant responses were replaced by more detailed accounts of their learning in interpersonal skills and self understanding. One participant wrote that the effect of Project Hahn was

pretty dramatic – it in essence gave me a glimpse of a new way to live my life - restored my faith in humanity,

gave me the courage and self-esteem to value myself and to continue to set and achieve goals true to my ideals.

Discussion

Major empirical findings of this study were positive changes in the scales for hopelessness and self-actualisation, a weaker effect for total self-esteem and a transitory effect for existential wellbeing. The Missing Values Analysis indicates that these changes are unlikely to be due to bias induced by selective drop-out of participants who had a more negative profile on the major measures.

As a total group, participants' scores tended to change by an ES of .55 on the BHS from pre-test to follow-up. The BHS was found to be highly significant at post and follow-up, and levels of hopelessness and negative expectancy continued to drop over time, suggesting a substantial change in negative beliefs that are linked to feelings of hopelessness. In the literature, BHS scores over 9 suggested a high risk of suicide (Katz, Katz & Shaw, 1999). At pre-test, a quarter of participants had a score of 9 or more, and this proportion of participants remained stable by post-test. However, by follow-up, the number of participants with scores above 9 was halved. This result suggests that 50% of participants identified as highly at risk of suicide had their scores significantly move within safer levels. Hence, the Project Hahn wilderness program may be seen as potentially inoculating against hopelessness.

The BHS items partially investigate some existential beliefs, but in a less emotive and more concrete manner. The finding that BHS scores continue to decrease after post-course (a positive finding) adds support to the argument that there is a change in participants' emotions into more structured, identifiable and concrete beliefs. This concurs with Hattie, Marsh, Neill & Richards (1997) and Russell (2002) who state that effects seem to increase over follow-up periods from 12 - 18 months. A study by Bianco, Houghton and Fernandez (2000) defined self-esteem as a transitory emotional state, whereas self-concept is a more stable belief system a person holds. Their research supports the theoretical stance that charged emotional states tend to be transitory and are translated into more enduring cognitive beliefs about the self. Perhaps at least a period of 3 months is needed before the transformation from emotion into beliefs can be consciously articulated, and the full effects of cognitive-based measures may be limited if it is administered before there has been ample time for cognitive changes in participants' belief. The dynamic of change from high affect to calmer cognisance may also rely upon significant unconscious reflections of the mind. As Ringer (2002) notes, perceived

anxiety and danger result in different routing of memory information than if the same event occurred in a low anxiety system.

Participants also made positive growth from pre to follow-up in their self-actualisation ($ES = .49$), suggesting that participants became more focused at living in the present, their behaviour becoming internally directed rather than being directed by others (e.g., peers). This focus is essential in developing assertiveness and resilience. In terms of replication, SAI gains in the present study emerged at follow-up, while for the earlier study, SAI measures were only achieved immediately post course, fading thereafter. The increased significance of these findings may be due to many factors, for instance: differences in participant mix (the original population sample had an older mean age 19.5 years versus 15 years and had a larger number of participants referred from correctional services), increased staff professional development, program constructive review processes, or a combination of these.

The finding of significant post- and follow-up self-esteem scores in this study generally converge, complement and extend the previous evaluative research on Project Hahn. Follow-up after a minimum of three months found that the self-esteem effects remained stable, and the elevated feelings of positivism, purpose and meaning faded to pre-test levels. Interestingly, as a group, participants in both studies had high levels of social self-esteem. This issue of high esteem in the current participants may reflect recruiting processes, with Project Hahn failing to attract youth who are socially unconfident. Denholm and Sveen (1999) found that participants' initial fears were mainly focused on whether they would be accepted by the group, rather than being intimidated by the activities.

Regardless of gender, participants made large significant positive post-course gains in existential wellbeing (EWB); however, these effects disappeared by follow-up, suggesting that changes to EWB were transitory. Although Hattie et al. (1997) generally downplay a hypothesis of post-course euphoria in their meta-analytical studies, it may be responsible for the large elevation in EWB. An alternative hypothesis is that given the EWB items reflect emotions and feelings about happiness and purpose, gains in EWB may be reflecting a state of peak experiences and/or a generalised state of positive affect and wellbeing.

Summary

This study offers a practical research design for wilderness program researchers to evaluate and capture the benefits and dynamics of wilderness programs. Overall, the study supports the continuing value of wilderness programs for at-

risk youth while adding to a growing body of literature focusing on the dynamic processes of psychological change in adolescents.

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