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A Meta-Analysis of the Effects of Adventure Programming on Locus of Control

Tracy Allison Hans

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Abstract

In the growing field of Adventure Therapy there exists a need to link valuable program characteristics to specific outcomes. Locus of control has been theorized to be a moderator of change in outdoor adventure programs, however past research has yielded inconsistent and contradicting results. An attempt was made to replicate the effect size of 0.30 generated within the comprehensive meta-analyses of both D. Cason (1993) and J. Hattie et al. (1997). A slightly higher effect size of 0.38 was computed, substantiating evidence that subjects across studies became significantly more internal as a result of participation. Investigation of specific outcomes yielded two possible variables as moderators of locus of control effect size: program goal and daily duration.

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Many studies of adventure programming have looked at self-concept in an attempt to understand program efficacy. However, it has been hypothesized that overall self-concept may be too broad a concept to describe changes evidenced by intervention programs such as these. Locus of Control (LOC), a personality construct that assesses how people attribute their success and failure outcomes, has been theorized to be a moderator of change in these programs. Examining differences in LOC effect across program characteristics can help set the stage for a more in depth understanding of how change occurs as a result of these programs. In deciding upon what program characteristics to examine, it is necessary to review terminology and thoroughly survey the existing research.

Adventure Programming

Adventure programming has become increasingly popular in the past few decades. It incorporates the philosophy of "experiential education". 'Experiential' is a term that people typically use when describing the active process of experiencing or doing. Experiential education can be defined as 'learning by doing' with reflection (Gass,1993).[i] When people are learning experientially, all of their senses are actively engaged and they are totally absorbed in the experience. For example, a high school class is planting a garden and at the same time learning lessons in earth science and mathematics. An elementary school class travels outside several times in a day to stand in their footsteps and trace their shadows. Continual reflection and discussion focuses on the implications of their shadow moving (they might conclude at first that the sun moves, and then more accurately, that the earth moves around the sun).

In adventure programs, individuals or groups are placed in "real to life" situations in

which they have to employ problem solving or otherwise creative methods to deal with the

environment around them and the task at hand. Participants take on the responsibility of

interpreting and manipulating novel stimuli they encounter. The actions they take to adjust or

cope with their surroundings are made salient and provide learning opportunities. Adventure

programs utilize metaphors associated with (or inherent within) these "real to life" situations to

guide participant learning. An adventure activity might be an endeavor such as a hike or a rock

climb, or may be a facilitated outdoor or indoor problem solving game (initiative).

A program which has been very influential to the advent of modern day adventure

programming is Outward Bound. Its establishment can be traced back to the early 1940's and a

man named Kurt Hahn. To help sailors better prepare for the rigors of war, they faced a

rigorous, physically and emotionally demanding month long program. This included small boats

training, athletics, orienteering and rescue training, as well as an expedition at sea. The course

was designed to strengthen moral character and improve flexibility and adaptability to the

conditions of war, and in addition, build upon endurance and strength (Hahn, 1957).

Priest and Gass (1998) describe four categories into which current adventure programs

can be divided, based upon program goals. Recreational programs focus on changing the way

people feel, educational programs focus on changing the way people think, developmental

programs focus on changing the way people behave, and therapeutic programs focus on

changing the way people mis-, or malbehave.

In the past few decades, research with these types of programs has brought forth its

expansion into therapeutic settings (Gass, 1993). In recent years, experiential therapies (that

promote healing by doing) have gained in popularity. Though there are many types of experiential therapies (e.g., Art Therapy, Play Therapy, Psychodrama), the type that is most similar to these aforementioned programs has been described as 'Adventure Therapy'.

Adventure Therapy

"Adventure Therapy" is defined by Ringer (1994) as a generic term that refers to a class of change-oriented, group-based experiential learning processes that occur in the context of a contractual, empowering, and empathetic professional relationship. Gillis and Thomsen (1996) add that risk is explicitly stated in the term. They suggest "it is this element of risk and the positive or negative stress produced through resolution that defines Adventure Therapy from other forms of experiential therapies" (p. 11).

Adventure Therapy incorporates experiential learning. It might be thought of as an integration of psychological theory and educational delivery. Gillis and Thomsen (1996) elaborate on the different components (or common features) of Adventure Therapy, originally defined by Gass (1993). They include (a) wilderness therapy, (b) adventure-based activity therapy, and (c) long term residential camping. These components are categorized by the venue of the treatment, therapeutic program length, and the particular (programmatic) components involved. Although the authors refer to therapeutic environments, these components exist in the broad field of adventure programming as well.

Wilderness therapy takes place in remote settings like the name implies. Participants often travel long distances without returning to a home base. Many of these programs focus on survival skills. Wilderness programs follow either short or long term expedition formats. The

short term formats are often associated with Outward Bound's model. These programs utilize a

7 to 31 day expedition format that has elements of teaching and practicing wilderness skills.

Longer wilderness expeditions (60 days or longer) appear to differ from the Outward Bound

model but have not been studied with as much clarity to be able to clearly highlight differences

(Gillis & Thomsen, 1996).

Adventure-based activity therapy centers on team games and problem-solving initiatives

and can also include low and high challenge ropes course activities. This approach takes place

near a facility and rarely in 'remote' settings. The experiences tend to be "contrived", in an

attempt to mimic life situations, struggles or interactions. For example these experiences might

include portable initiative activities or indoor rock-climbing walls.

Long term residential camping programs (which appear to be flourishing in the

Southeastern U.S.) are, in general, used to work with more severely troubled youth. They are

usually based on similar values inherent in wilderness programs. Long term residential camping

programs are further characterized by Buie (1996) as utilizing considerable wilderness acreage, a

permanent base camp, with temporary campsites built by campers (usually tent covered wood

platforms). The campers live there for a normal minimum of about one year, extending to two or

more years when necessary. The campers take trips to various wilderness places, and participate

in various activities (e.g., hiking, white-water rafting or climbing).

As the field of adventure programming evidences a rise in the number of therapeutic

adventure programs, the need to research program effectiveness is reinforced. To inform the

specific field of Adventure Therapy, it is necessary to gather information from the broader field

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of adventure programming.

Comprehensive Literature Reviews

In a literature review specific to wilderness programming, Achuff (1997) cites research that documents participant improvement in the following areas: reducing recidivism rates, increasing self-esteem, aggressive behavior and drug use, increasing internal LOC, producing feelings of accomplishment and success, improving problem solving and decision making skills, and improving positive peer relations (see author for further discussion of this topic).

Burton (1981) conducted a critical analysis and review of Outward Bound and related programs.[ii] Wilderness programs (involving short term expedition formats) and long term residential camping program were evaluated. Although he did not apply statistical procedures, Burton used a method of tabulation and examined studies by placing their findings into four categories. These categories were: (a) "mostly positive"- studies in which more than 30% of the outcome measures showed a significantly positive effect, (b) "some positive"- studies in which less than 30% of the outcome measures showed a significantly positive effect, (c) "non-significant"- studies which showed non-significant results, and (d) "negative"- studies in which more than 10% of the outcome measures were significantly negative. His analysis of 161 studies found 38% falling in the "mostly positive" category, 26% in the "some positive" category, 34% in the "non-significant" category, and 2% in the "negative" category. An almost equal percentage of studies fell into the categories of "mostly positive" and "non-significant". Burton's analysis demonstrates the inconsistency of research results in the field of adventure programming. Tholkes (1994) compiled a list of studies that assessed the effects of a

ropes course experience. A ropes course is a frequently utilized tool in adventure programming. By design it is more activity based than wilderness experiences or camping, and usually utilized as a short-term program component. Studies measuring the effects of this experience on participants report it to promote trust, cooperation and communication skills; increase internal LOC; and enhance self-esteem, leadership, and decision-making.

Cason (1993) conducted a meta-analysis (quantitative summation of the literature) on the overall effects of adventure programming with adolescents.[iii] Her research generated an average treatment effect size of 0.31, based on 43 studies and 235 effect sizes. The effect size represents a 12.2% improvement for the average adolescent as a result of participating. Stated another way, the average adolescent participating in an adventure program is better off than 62% of adolescents who do not participate.

More recently, Hattie, Marsh, Neill, and Richards (1997) conducted a meta-analysis examining Outward Bound and related adventure programs.[iv] Their research generated an average treatment effect size of 0.34. Their analysis, based on 151 studies and 1728 effect sizes, found the average participant in an adventure program is better off than 65% of non participants.

Although research has successfully linked the above outcomes to adventure programs, researchers and practitioners alike express concern with the findings. A common cry is that summations of efficacy have thus far not been particularly helpful in supporting and improving the field.

Witman (1993) posits that adventure program involvement has been linked to a variety of positive outcomes however the causes of such changes have not been identified. Burton (1981)

argued that there has been an ample amount of outcome studies demonstrating overall efficacy of adventure programming. He commented that because these programs differ in size, length, location, activities, instruction, population, and goals, future research should examine these components and their interactions.

Similarly, Ewert (1987) observed that research in adventure programming needs to move beyond what happens as a result of programs to determining how and why it happened. He further purports that determining salient, valuable program characteristics can serve as a blueprint for future research which links characteristics and outcomes.

In regards to Adventure Therapy, Gillis and Thomsen (1996) state the importance of knowing more specifically what type of program is most effective with which populations and problems. Blanchard (1992) comments that the notion of active learning in the process of therapy is widely accepted, but it is unknown how the complex nature of these processes interact, and how programs should be structured to facilitate change. These authors recommend that further research be pursued to assess efficacy across populations, problems and settings.

<div align="center">Self-concept and Adventure Programming</div>

A majority of the attempts to assess efficacy of adventure programming have focused on a particular single measure. Comprehensive literature reviews indicate that self-concept is the most researched construct in adventure programming (Burton, 1981; Marsh, Richards & Barnes, 1986). Furthermore, Marsh et al. propose that changes in self-concept might be the easiest and most concise way to describe differences seen after program participation, however, intervention research rarely demonstrates systematic changes in the construct. In other words, research

looking at self-concept change as a result of interventions is often inconclusive and contradictory.

Though adventure programming often entails a brief intervention, it's delivery and nature can be quite complex. Some researchers are beginning to question if self-concept measures are too broad to measure the efficacy of these programs (Marsh et al., 1986; and Hattie et al., 1997.). We know already that documenting the benefits of these experiences does not tell us much about how or why the changes take place (Ewert, 1987). If researchers are interested in improving upon existing programming (capitalizing on programmatic benefits), the question of "What does adventure programming do?" must first be redefined. Seligman (1995) categorizes the reframing of the question by distinguishing between research that focuses on efficacy (what is effected), and research that focuses on effectiveness (how and why it is effected). The latter would attempt to identify patterns in mean changes across programmatic variables.

Marsh et al. (1986) point out that most of the time it is assumed that everyone knows what self-concept is; in fact many of the studies that include the term do not include a definition of it. Researchers fail to describe what it is they are studying. Some have proposed that self-concept can consist of many different things. Marsh et al. cite a multi-faceted, hierarchical model of self-concept proposed by Shavelson in 1976. Based on this model, they developed a multi-dimensional self-concept measurement, the Self-Description Questionnaire (SDQ) that they used in evaluation of Outward Bound program participation. The authors cite that research conducted using the SDQ has demonstrated changes in self-concept to be reliable and systematic. However (and perhaps most importantly), their results suggested that these changes

were multidimensional: specific to particular dimensions of self-concept rather than generalized across all dimensions. They conclude that

> Some areas of self-concept will be logically related to the goals of
>
> an intervention, whereas others will not. Overall self-concept
>
> might be effected less from an intervention, than a specific aspect
>
> of it. In other words, while overall self-concept can be seen as
>
> generally stable, changes that do take place are reliable and
>
> specific to particular dimensions of it (p. 196).

Though their study evidenced correlations between different identified aspects of self-concept, we can only speculate on causality. Furthermore, the authors evaluated a single type of adventure program which makes it is difficult to generalize results. Thus the overall picture still remains unclear. Nonetheless, this research highlights the need to look at the interaction of specific construct dimensions and aspects of an intervention more closely.

Research in adventure programming seems to cry for more descriptive and specific results. A meta-analysis can accommodate this by <u>categorical model testing</u>, whereby different study characteristics are isolated and their effects compared across studies. Meta-analytic research can highlight a specific construct, intervention or population as an independent variable and assess the pooled studies across a number of different variables.

<center>Locus of Control and Adventure Programming</center>

In an analysis of their meta-analytic outcomes, Hattie et al. (1997) noted that the highest seven effect sizes generated seemed to center around the theme of self control.[v] Among them

was LOC, which a number of adventure programs have employed in observing outcomes. LOC was first defined by Rotter in 1966 as the degree that an individual expects that a contingent relationship exists between one's behaviors (actions) and outcomes (reinforcements).

Burton's (1981) critical analysis of Outward Bound and related programs (discussed earlier) examined eight studies that included LOC assessment. Of these, he found that three fell in the "mostly positive" category, one in the "some positive", and four in the "non-significant" category.

The two previously discussed comprehensive meta-analyses isolated effect sizes for the measure of LOC (apart from overall 'outcome'). Both studies (Cason, 1993; and Hattie et al., 1997) found an identical LOC effect size of 0.30, analyzing 13 and 18 studies, respectively. Upon reviewing their study, Hattie et al. surmise that some adventure programs seemed to be effective only on some outcomes, and that probably only parts of the program influence these outcomes.

Locus of Control Scales

Rotter's original (1966) scale was based on "internal" and "external" (I. E.) control characteristics. **The I. E. measure consists of a 23 item, forced-choice scale. A high score denotes a more "external" orientation, while a lower one denotes a more "internal" orientation. People who score closer toward the "internal" direction attribute success and failure outcomes mainly to factors under their own control. Conversely, people who score closer toward the "external" direction attribute outcomes to factors out of their control (for instance, the environment or fate).**

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In 1973, Nowicki & Strickland developed a LOC scale that was specifically suited for children. The CNSIE (Children's Nowicki-Strickland Internal-External) was geared toward those between the ages of 9-18 years. Soon thereafter, the authors modified Rotter's adult scale into a more simpler form, resulting in the ANSIE (Adult Nowicki-Strickland Internal-External) control scale (Nowicki and Duke, 1974). The CNSIE and ANSIE both consist of 40 forced choice (yes or no) questions.

Locus of Control Data.

Rotter (1966) suggests that internality is a more positive orientation than externality. Nowicki and Barnes (1973) report that studies using adult measures of LOC have found internality to be positively related to a number of variables such as achievement motivation, number of activities engaged in, level of aspiration, and information seeking. Freeman, Anderson, Kairey and Hunt (1982) sum related findings that internals have higher achievement levels both in a normal population and with emotionally disturbed children. Deery (1983) reviews internality and finds evidence that internals are seen as being more self-confident, less anxious, and more likely to take steps to improve their environment. Along similar lines, Shasby and Gansneder (1984) site studies correlating high internality with high scores of measures of personal adjustment and self-esteem. Langsner and Anderson (1987) reviewed studies in which results positively correlated self-concept or self-esteem and locus of control. Nowicki and Duke (1983) report in a literature review that various research has correlated internality on the Nowicki-Strickland (N. S.) scales positively with achievement, age, deeper self-disclosure, greater reflectivity, more altruism, less distancing from strangers, greater persistence, leadership

and popularity, increased levels of social interest, as well as increased ability to delay

gratification. Additionally, they cite other research which finds internality to be negatively

correlated with debilitating anxiety, authoritarianism, helplessness, defensiveness, feelings of

guilt, and conformity.

It is of interest to note the relative stability of LOC. In their review, Nowicki and Duke

(1983) report that competence may be the most significant of the variables in accounting for

LOC change and that planned risk taking may also be a significant factor. Furthermore, self-

confidence, leadership qualities and cooperative traits are mentioned as descriptive variables in

the LOC internality research and appear to merit important consideration. According to

Akrakelian (1980), a change in LOC orientation is likely to occur if reinforcements in new social

experience change previous patterns of success and failure. If we believe this, then we believe

that great potential exists for altering a person's expectancy when there is consistent change of

reinforcement.

Shift Toward Internality. Review of the research on LOC and ropes courses strongly

suggests that five 'ropes course' variables (risk, competence, leadership, cooperation and self-

esteem) may be positively related to internality on the LOC scale (Joynt, 1974). Dacey (1976,

cited in Joynt, 1974) reports:

> The Ropes Course is the most powerful technique I know for
>
> helping children deal with their anxieties and antagonisms. It is a
>
> means of rapidly and effectively giving them more internal LOC.
>
> It promotes this characteristic by effecting for others; risk-taking,

> cooperativeness, leadership, and a sense of competence... The
>
> Ropes Course is a sensory rather than intellectual approach to
>
> improving self-concept. So many times, school involves talking
>
> about things rather than actually doing them. It has been our
>
> experience that to improve a child's self-concept, actual
>
> experiences are essential (p. 154).

Overall, the therapeutic adventure experience attempts to create situations in which persons experience (and can experiment with) different reinforcements. Kelly and Baer (1969) state "An underlying assumption of the adventure model is that individuals should not just be told that they are capable of more than they think they can do, but rather, a set of circumstances must be devised where they demonstrate such competencies to themselves" (p. 12).

Along these lines, Bandoroff (1989) believes that a basic goal of wilderness adventure programs is that the participant becomes more aware of self. He argues that these experiences enable participants to regulate their own behavior. Adventure programs aim to make clearer the connection between a client's behavior and the resultant reinforcement. Much of the feedback (or reinforcement) received in these novel environments is immediate and realistic. Thus, the assumption is that control over the environment will be the resulting coping behavior that is evoked.

A theory underlying many adventure programs is that increasing participant awareness of available choices (about participation, cooperation, level of commitment, etc.) will enable them to more readily accept responsibility for their level of success in the program. As a result, they

will feel more in control of self, necessitating that a certain degree of internality be present.

Along similar lines, Priest and Baillie (1987) state "The aim of adventure education is to create astute adventurers: people who are correct in their perceptions of individual competence and situational risk" (p. 18). More recently, Priest (1993) presents a model for risk taking which hypothesizes that participants will be able to influence their probability of success in an adventure experience if they have realistic perceptions of risk and competence. This suggests that having an ability to influence these situations becomes a motivating force towards increasing self awareness, or 'astuteness'. Taylor (1989) explains that increased levels of confidence, skill, and self-awareness that these participants gain might encourage them to see uncertainty that exists in many life situations, as a challenge and not a threat. If uncertainty is viewed as a threat, it is more likely that a person will perceive the threat from an external orientation. Taylor's hypothesis is that increased exposure to uncertainty, or ambiguity, accompanied by increased levels of confidence and skill, will facilitate a coping response. Thus, participants would begin to view similar situations as being under their control.

In summary, the assumptions of the researchers reviewed here is that by becoming aware of available choices, and by experimenting with different reinforcements in an environment where one is receiving immediate and realistic feedback, participants can influence their probability of success. Furthermore, they can demonstrate competencies, build upon skills, accept personal responsibility, more accurately assess themselves, and maintain a higher degree of control over their environment. Having an increased capacity to regulate one's own behavior will facilitate increased levels of self-awareness, competence and along with this, internal LOC.

Shift toward externality. Interestingly, Gaar (1981) found a significant, positive

relationship between externality and interpersonal trust after participation in a wilderness

adventure program. Terming this adaptive externality, she suggests that the wilderness program

(and its associated social group) fosters adaptation to the degree of uncertainty inherent in the

milieu. A healthy response to uncertainty would require participants to incorporate some degree

of externalized LOC belief.

Kelly and Baer (1971) attribute an externalized LOC shift to a delinquent's attitude

toward authority figures and habit of ignoring laws being challenged by the new environment.

These habitual behaviors are quickly evidenced as counterproductive as they are overridden by

dependence upon the patrol leader for success and well-being.

Overall, as a result of wilderness programming, participants (a) are exposed to a high

degree of uncertainty and ambiguity in novel environments, (b) must rely at times on a

facilitator's skills to survive, and (c) must deal with impositions of natural consequences

(nature's reinforcements). These all can serve to place control outside of participants grasp, and

as a result lend credence to Gaar's (1981) notion of adaptive externality. Thus, it is feasible that

becoming more self-aware might require participants to adopt a more external LOC orientation.

Theoretical links are evidenced to support LOC movement in both directions as a result

of participation in adventure programming. In speculating what moderates this movement, a

rationalization is that programmatic differences (e. g., wilderness vs. activity based) can

influence the direction of change.

<center>Hypotheses</center>

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It was stated earlier that Marsh et al. (1997) found some areas of self-concept to be logically related to program goals, while others were not. Of interest to this researcher was determining if this held true for internal vs. external LOC. In other words, it was questioned if specific goals and program characteristics (activities, duration, population, etc.) would differ in their effect upon the orientation of LOC change. As of such, the specific hypotheses pertaining to this meta-analysis were: (a) There is an overall treatment effect of adventure programming on LOC, and (b) the treatment effect will vary across program characteristics.

Method

In undertaking this study, an effort was put forth to collect all the available empirical studies found in the literature that met several requirements. The requirements of the studies included in this meta-analysis were that (a) each included a pre and post-test assessment of LOC, (b) each contained (at least as part of its program) an experiential adventure/wilderness component, and (c) the LOC assessment was either Nowicki-Strickland (N. S.) or Rotter (I. E.). An average effect size of LOC in adventure programming could be calculated. Following this, effect size averages were examined across the different outlined variables.

Data Collection

Studies were located via database searches of Educational Resources Information Center (ERIC), PsychLit and Dissertation Abstracts International (DAI). Perusal of the reference sections of obtained articles and dissertations yielded more studies, as did responses to queries forwarded to Internet listserves (Association for Experiential Education-AEElist@lists.Princeton.edu) and the (Adventure Therapy- ADVTHE-L@uga.cc.uga.edu).

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The above search yielded a total of 45 identifiable studies. Thirty-five studies were able to be obtained, however 11 were discarded. The discarded studies were found to either assess multi-dimensional LOC, or include only longitudinal post-testing. In addition, two of the studies omitted a description of the programming involved. (A reference of unobtained studies is included in Appendix A). In summary, 24 studies (1,632 subjects) were included in the meta-analysis, generating a total of 30 effect sizes. (Some authors examined their data samples separately or had more than one experimental group, resulting in more than one effect size for the same study). The 24 studies involve programs run between the years of 1972 - 1995. They were all conducted in either the United States or Australia. Appendix B displays the studies as well as program characteristics and assigned variables.

Data Synthesis

The statistical package, D-stat (Johnson, 1989) was used to integrate the gathered data. An effect size (g) was computed from each separate study. The effect size consisted of the mean post-test score minus the pre-test score divided by the standard deviation of the post-test score. If means and standard deviations were not specifically reported, they were obtained by solving equations involving available statistical data. All of the g's were converted into effect sizes (d) which accounted for sampling size bias, and then weighted (by the reciprocal of the effect size variance) to produce d_+. This final statistic places more emphasis on the effect sizes derived from larger sample sizes. All d's were then combined and averaged to yield a single indicator of the power of the dependent variable, in this case LOC. To determine how homogeneous the effects were between different studies, a homogeneity statistic, Q, was calculated. Q determines

whether or not (and to what degree) individual $\underline{d}$'s share an overall common effect size.

Moderating variables are used as categorical models, when either there is an absence of

homogeneity across studies, or when a researcher is testing a specific theoretical underpinning

hypothesized to moderate effect size.

The goal of this analysis was to determine the effect particular adventure programs had

on LOC, as well as to search for hypothesized moderators of that effect size. Thus, moderating

variables were coded for in an attempt to identify divisions of effect sizes. After coding for

moderators, a researcher can compute a between-category homogeneity statistic ($\underline{Qb}$), as well as

a within-category statistic ($\underline{Qw}$) for each variable. These statistics indicate how consistent

(across and within studies) the generated effect sizes are for each variable.

Coding Moderator Variables

Fourteen moderator variables were coded in this project. The coding was categorical;

thus each study had only one number assigned to it designating into which category it fell. A

sample of the coding measures can be found in Appendix C, along with the number of studies

falling under each category. (For example, there were eight studies that were reported in the

1970's and seven that were reported in the 1990's). All variables were coded by two independent

raters. Coding discrepancies between raters were addressed and negotiated.

The previously discussed meta-analyses (Cason, 1993; and Hattie et al., 1997) both

concurred on discovering several important moderating variables to explain most of the variance

of effect sizes. These include length of program, age of participants and country of program.

Two of these variables were maintained (coded) in the present study. In generating LOC

moderator variables, the experimenter scanned and then charted the available sample information. In deriving variable categories, an attempt was made to look for gaps as well as similarities in the data across studies.

The coding of some variables across studies was fairly straightforward. The year coded (item #1) was the year of the study. The sample size (item #2) refers to only the number of subjects who underwent the treatment condition; data from control subjects were omitted for the purposes of this study. The length of the program (item #5) was coded as it was reported and included total time between the pre and post-testing of subjects. The particular LOC assessment (item #7) was coded as either N. S. or I. E. There were three studies that utilized a modified LOC assessment (shorter version of N. S. or I. E. scale), this was coded for under item #14. The age of participants (item #9) was coded by range, as all but two of the studies included specific information. There were four studies that did not have coed populations, this was coded for by item #10. The number of program components listed from each study was tallied and coded for by item #11. If the treatment specifically involved a physical fitness component (e.g., marathon, aerobics, physical education class), it was coded as "Yes" for item #13.

The codes for population (item #3) were 1) Non-clinical, 2) Non-clinical referred, 3) Adjudicated, and 4) Clinical. Included in the non-clinical group were school groups, Outward Bound participants and volunteers. Included in the non-clinical referred were special populations that were referred but did not carry a diagnosis. Examples were youths labeled 'at-risk', 'learning disabled', 'sensory challenged'-deaf or blind, rape victims, foster home residents and counseling agency referrals (that did not specify a diagnosis). The third category,

adjudicated, included all studies in which the population was court referred youth. The last

category, clinical, included studies in which subjects had a mental health (DSM) diagnosis.

For the variable goal, six different categories were identified (see item #4). The

differences evidenced among three of them (Educational, Developmental, and Prevention) were

so minimal and varied across studies, that they were collapsed into one category: EDP. The

categories were 1) Recreation, 2) Educational/ Developmental/ Prevention, 3) Adjunctive

Therapy, and 4) Primary Therapy. Both raters assigned one goal to each study, the first two

categories based on Priest and Gass' (1998) distinctions, discussed in the introduction. They are

listed on a continuum of intensity, from recreation to therapy. Studies that received a coding of

'Adjunctive Therapy' included subjects that were receiving some other type of therapy as well as

a therapeutic adventure component. Studies that received a code of 'Primary Therapy' included

subjects for whom this was the only type of therapeutic intervention. Upon careful review of the

studies, it could be discerned that many had multiple goals; in those cases the one that was

chosen was the one furthest along on the continuum (i.e., the most intense).

Recent literature notes a distinction between three theoretical underpinnings, as discussed

in the introduction. The distinctions involve program components and the trend towards a (a)

camping based model, (b) wilderness/expedition based model, and (c) Activity based/short term

model (see item #5). Most of the studies obtained had an activity based component; the ones

receiving a 3 did not involve an expedition and did not involve extensive camping and

wilderness activities. This variable allows for evaluation of the adaptive externality hypothesis--

to see if programming that incorporated wilderness expeditions (categories 2 and 3) evidences

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significant shifts toward externalized LOC.

One variable concerned the daily duration of programs (item #8). The categories were: 1) Pure residential, 2) Mix, and 3) Out-patient. Studies in which participants were together for the entire duration of the program (between pre and post assessment) received a coding of 1, pure residential. In the case that the program included a combination of daily meetings mixed with overnights (where for some portion of time subjects returned home), this received a code of 2, mix. This category also included a study of hospitalized inpatients who were together throughout the program but the intervention was not constant (Ziven,1988). Studies received a code of 3 if the treatment condition was out-patient.

There were a handful of studies that included service projects (SERV), survival skills training (SS), or wilderness/ expedition planning phases (PLAN). The experimenter wondered if the addition (or absence) of these components had an effect on LOC. This variable (item #12) was labeled transfer of skills and included 1) Direct (studies including the components) and 2) Indirect (studies that did not).

<div align="center">Results</div>

Table 1 contains a summary of the study-level effect sizes. The overall effect size reflects the degree of treatment effect on participant LOC. A positive mean effect size of 0.38 was computed. The weighted mean effect size (accounting for sample size), was computed as 0.36. This suggests that subject's across all studies became significantly more internal as a result of the adventure program. The effect size is considered significantly different from zero because its confidence interval does not include zero (95% CI= +0.31/ +.45). Table 1 indicates that the

effects in the overall meta-analysis were homogeneous (Qw(29)= 41.16); p= 0.13. Since the

probability of the within statistic is greater than .05, this suggests that there is homogeneity

within studies included in the meta-analysis. In other words, all of the studies contained

essentially the same magnitude of effect. Because a high degree of homogeneity existed

between studies, it was questionable whether or not categorical testing would be useful. The

assessment yielded highly consistent findings across studies which did not leave much variability

to be accounted for by moderator variables.

Table 2 includes the effect sizes generated from each study. A positive effect size

represents a mean increase in internality while a negative effect size represents a mean increase

in externality. Again, an effect size is considered significantly different from zero if its

confidence interval does not include zero. Seven out of the 30 effect sizes satisfied this

contingency, thus they demonstrate significant results.

Table 3 displays the effect sizes across moderator variables. If there exists significant

homogeneity between categories of a variable, and in addition non-significant homogeneity

within categories of that variable, then the variable is considered a moderator of effect size.

There were only two variables that met both these criteria: goal and daily duration.

The variable goal evidences the probability of homogeneity between variables (Qb) to be

just barely significant (p= .046), and the homogeneity within the four categories to be non-

significant. In order to determine between which specific categories the heterogeneity existed,

an a priori analysis was performed. The mean calculated effect size for programs with Primary

Therapy goals differed significantly from the mean calculated effect sizes for those with goals of

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Education/Development/Prevention and Adjunctive Therapy.

The variable <u>daily duration</u> also demonstrated the probability of homogeneity between (<u>Qb</u>) to be significant (<u>p</u>= .047), and the homogeneity within the three categories to be non-significant. As with the variable <u>goal</u>, an a priori analysis was performed for <u>daily duration</u>. The mean effect size for Out-patient programs differed significantly from the mean effect sizes of Residential and Mixed programs.

Discussion

The present research gathered data on LOC effect purported as a result of adventure programming. The main purpose of the analysis was to help set the stage for determining relationships between specific programmatic dimensions, or characteristics, and the psychological construct of LOC. LOC effect sizes were isolated and compared according to various programmatic differences, so as to further investigate specific relationships.

The first hypothesis was that there would be an evidenced treatment effect of adventure programming on LOC. An attempt was made to replicate the LOC effect sizes generated in the comprehensive meta-analyses of Cason (1993) and Hattie et al. (1997). Appendix D provides a summary of the comparative findings. This analysis found an overall 0.38 effect size as opposed to the 0.30 identified by the aforementioned researchers. It is speculated that the small discrepancy might exist because there were more studies included (and more effect sizes generated) from this analysis (30 vs. 13 and 16). Thus, 0.38 or 0.36 might be more indicative of the actual magnitude of change. In evaluating this statistic, it should be noted that studies which attempt to depict changes in personality constructs (i.e., LOC), often encounter small effect

sizes. However, these small effect sizes can be very impressive and offer us practical value if the outcome is related to the aims of the intervention.

The second hypothesis was that the evidenced effect would vary across study characteristics. This was only partially supported, as a high degree of homogeneity in outcomes across studies was evidenced. In other words, results indicated there to be a significant shift in internality regardless of most program characteristics. Tabulation reveals that only two of 30 effect sizes generated were in the negative direction. Overall, seven of the 30 reflected statistically significant pre/post changes in the internal direction, with the remaining 21 reflecting positive but insignificant changes.

As mentioned earlier in the results section, not much variablity was left to be accounted for by moderator variables. Thus this analysis provides minimal insight into determining specifically what factors involve effecting LOC change, although it suggests two moderating variables.

It was also mentioned earlier that an effect size as small as 0.25 is generally considered to be educationally significant, while one of 0.50 is considered a conventional measure of practical significance, and usually found as a result of therapeutic environments (Wolf, 1986). The identified effect size from this study (0.38), falls about midway between the two. It was also stated earlier that therapeutic adventure might be thought of as an integration of psychological theory and educational delivery; results seem to support this notion. Though the field is experiencing an increase in the number of therapeutic adventure programs, few of them are being facilitated or supervised by mental health professionals. On a related note, only three out of the

14 studies with therapeutic goals involved clinical populations. Not so surprisingly, it was

evidenced by this analysis that on the whole, programs reporting a goal of primary therapy had a

significantly higher mean effect size (0.64) than those that reported goals of education,

development or prevention (0.35), and adjunctive therapy (0.30). Results suggest that program

goal acts as a moderator of LOC change.

Findings also suggest that the variable daily duration moderates the influence of

adventure programming on LOC. Hunter and Purcell (1984) compared a residential program

with a home-based program (for referred juvenile delinquents) otherwise treated almost

identically. Research supported their hypothesized location/success relationship, finding higher

success rates (based on recidivism, behavioral assessment and LOC) for the residential

participants. A theory underlying some adventure intervention programs (usually associated

with wilderness and long term camping programs) is that round the clock exposure to

participants enables practitioners to capitalize on teachable or 'learnable' moments that occur.

This author places value on the assumption and as a result expected to encounter a higher effect

size associated with residential programs. The present research indicated that the mean effect

size for the Residential category was significantly higher than the Out-patient category (0.40 vs.

0.20). Thus, participants involved in residential programs became significantly more

internalized in their LOC orientation than participants involved in out-patient programs.

Interestingly, the largest effect size was found to be associated with the Mixed category (0.53)

which was found to be significantly different from the Out-patient effect size. One can speculate

on why this is so; perhaps a combination of residential programming and returning to the home

aids in the integration of learning? If participants can assimilate their altered LOC attributions into different environments, this might aid in magnifying its effect. The intermittent reinforcement (returning to a mix, or semi-residential program) might aid in the generalization of learning. This argues the case for out-patient programs as well. Perhaps these participants experience situation- specific LOC change that cannot fully develop? It would follow then that augmenting the magnitude of change might require experiencing and transferring the learning to new environments. Although these implications seem to fit nicely with the findings, more research needs to be carried out in this area before speculating further.

Threats to Validity

There were a few challenges associated with executing this project which might undermine the validity of this undertaking. The first one concerns the quality of included studies. Some meta-analysts recommend discarding studies of poor quality from the analysis, cautioning that the studies may misrepresent the actual effect size (Wolf, 1986). The current analysis did not evaluate and code for the quality of studies. The author did not think this would be beneficial due to the relatively small number of studies identified and obtained. In addition, the process of discarding studies incorporates a degree of subjectivity into the meta-analytic process. Again, because of the small sample size, this might have been a valid concern. Thus, although there are obvious benefits to evaluating and coding (even discarding) methodically poor studies, the associated negatives seemed to outweigh the positives. The threat of poorly designed studies still remains.

Another threat to validity concerned the coding of moderator variables. Some research

reports were less detailed than others posing a challenge to coding variable categories. In cases where ambiguity existed, an attempt was made to contact programs or researchers to clarify necessary information, however this was not possible in all cases. The experimenters attempted to code with as much accuracy as possible with the knowledge that data might be skewed by experimenter bias. Due to the fact that all studies did not report information the same way, lack of specificity in coding categories resulted. For example, categories of the variable <u>age</u> incorporated ranges instead of means, because they were commonly reported in this way. In a similar vein, not enough statistics were reported to allow for calculation of pooled pre and post-test standard deviations to be incorporated into the effect sizes. Therefore the less specific measure (post-testing standard deviation) was consistently used. Lastly, two research reports displayed their results graphically. Accuracy from the estimated data is a concern.

Related to the lack of statistical accuracy was an evidenced lack of consistent definitions across research reports. Close examination of a few programs reporting inclusion of the same component revealed discrepancies regarding its delivery. For example one researcher reporting an 'experiential based' activity component used the term to refer to games while another used it to refer to initiatives and a ropes course experience. In 1996, Gillis and Thomsen made the recommendation that adventure programming researchers more clearly define what they are studying, for how long, and with what populations. Ambiguity in the current research further illustrates a need to clarify the terms we are using, particularly regarding program components. The fact that current terminology in the research reports is not overwhelmingly congruent contributes to threatening the validity of the current research.

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Recommendations for Future Research

The results of this analysis call for a more in-depth study of the daily duration of programming (e.g., residential,out-patient or a mix), and slated program goals (e.g., recreation, education primary or adjunctive therapy). Research should more closely examine these variables and their effects on participation.

Research discussed earlier purports that findings demonstrate participation in adventure programs to increase self-concept (Cason, 1993; and Hattie et al., 1997). Not so surprisingly, research comparing the two constructs has found internality and self-concept to be significantly positively correlated (see Langsner & Anderson, 1987). Surmising that the increase in self-concept reported from adventure programming is related to the shift in LOC towards internality, several studies have attempted to demonstrate this and met with inconsistent results. Determining the overall strength of this association would most likely be useful to the adventure practitioner. Though it is known that there is exists a relationship between the two, it is not known if internalized LOC (or a particular degree of it) is a precursor to increasing self-concept. Future research might include an attempt to examine this relationship more closely, looking at potential moderators.

Gordon and Bolick (1979) suggest that it is likely that internal children, perceiving a causal link between their behavior and subsequent events, are able to reinforce themselves according to changes in their behavior, whereas external children are not. This would foster a higher behavior-response contingency and thus a higher self-concept.   Future research might examine this more closely, perhaps separating participants according to their pre-test LOC scores

and correlating outcomes accordingly. It is conceivable that separating data would offer clues to understanding the relationship between internality and self-concept.

Additionally, it was mentioned earlier that self-concept measurement might be too broad of a measure in determining effectiveness. It might be more beneficial to examine how specific aspects of self-concept (i.e., those encompassed by the aforementioned SDQ measurement) interact with LOC. Qualitative data collection would aid researchers in hypothesizing which aspects it would be fruitful to focus on, as well as aid them in selecting appropriate moderators to code for.

Related constructs. It is possible that either the dimensional (internal/external) scale or LOC construct itself is not sensitive enough to effectively detect moderating variables. An examination of closely related concepts such as multi-dimensional LOC, causal attribution, and self-efficacy might lead us to a more specific assessment.

In order to test the hypothesis that a dimensional LOC scale is not sensitive enough, future research should incorporate multi-dimensional LOC. **Levenson (1973) devised a multi-dimensional assessment of LOC, incorporating <u>Internal, Powerful others and Chance</u> (IPC) attributions. She modified Rotter's (1966) I. E. scale by dividing the external category into two sources of control: Powerful others (P) and Chance (C). With the powerful others category, there remains the <u>potential</u> for attaining control, whereas with the chance category individuals feel that the world is random, unordered, and unpredictable. Thus, the multi-dimensional approach measures the extent to which a person feels things happen due to his/her own influence, the influence of others, or the**

influence of chance. This measure yields three distinctly independent scores. The increased specificity of this measure might help determine specific LOC moderators involved in these complex adventure programs. It also might aid in explaining the relationship between LOC and self-concept. Some research in the adventure programming field has incorporated this multi-dimensional measure (Bertolami, 1981; Boyle, 1985; Collingwood, 1972; Huie, 1984; Langsner & Anderson, 1987; Pawlowski, Holme & Hafner, 1993); it is a recommendation of this author that these be examined more closely. Arnold (1985) found LOC to significantly relate to external causal attribution of task performance. Causal attribution has been classified by Weiner (1985) according to three perceptions: (a) causality (internal vs. external), (b) stability (stable vs. unstable), and (c) controllability (the degree to which the attribution is perceived as under personal control). Utilizing scales that assess according to these rather specific dimensions might prove to be more worthwhile and allow researchers or program facilitators to discover more about what moderates change.

Another closely related concept, self-efficacy, is based upon information derived from both internal and external sources, and is more than mere self-confidence (Bandura, 1977). Self-efficacy falls along three dimensions: magnitude (the degree of certainty associated with success as influenced by perceptions of risk and difficulty), strength (the duration of expectations for success despite contradictory information), and generality (the potential for transfer of self-efficacy beliefs from one situation to another). Again, this construct might prove to be useful in shedding light on what moderates change in adventure programs.

Conclusion

The current analysis found a modest yet significant shift in internality regardless of most program characteristics. This should not deter the reader from carrying out closely related research. This study provides clarity into possible moderators of change and highlights areas ripe for study. Targeting these areas will expedite growth within the more specific field of Adventure Therapy.

In summary, if our concepts or measurements of the concepts are too broad, there exists little chance of determining specific relationships or causalities. Studies should therefore incorporate more specific assessments and constructs. Future research reports should be sure to include specific information, including details regarding the types of activities and definitions of program components. Researchers in the field should continue to strive for clarity and specificity which will aid us in our attempt to isolate moderators of change associated with adventure programs. In discovering these moderators, programs can be designed accordingly-- tailored to specific aspects of desired change. It is in this way that adventure programming holds the possibility of becoming more effective and efficient.

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Appendix A

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Appendix B

Summary of Studies in Meta-Analysis

Study	Subjects	POP[a]/Goal	Length/DUR[b]	Components	Philosophy	ASSESS[c]	Results
Anderson (1995)	N=33 13-18yo	NON-CLIN REF	52 days	EXP, PLAN, SS, BACK, INIT, SOLO	EXP	I. E.	Non-sig increase in INT
		PRIM THER	RES				
Callahan (1989)	N=35 13-17yo	ADJ	6 months	RC, INIT, ROCK, CAVE, BACK, CAMP, SS, PLAN, WATER, REC, RUN	ACT	I. E. MOD	Sig increase in INT
		PRIM THER	MIX				
Corsica (1987)	N=17 12-15yo	ADJ	1 week	RC, INIT, CAMP	BASE	N. S.	Non-sig decrease in INT
		PREV	RES				
Davis-Berman & Berman, (1989)	N=23 13-18yo	ADJ	2 weeks	CAMP, BACK	BASE	I. E.	Non sig increase in INT
		ADJ THER	MIX				
Doyle (1981)	N= 17 N= 18 18-32yo	NON-CLIN	•9 month init prep •above plus 110 day EXP	•PLAN INIT, RUN •PLAN INIT, RUN EXP	ACT, EXP	N. S.	Non sig increase in INT
		DEVEL	MIX				
Elsted (1989)	N=5 14-17yo	CLIN	10 weeks	INIT, RC, CAVE	BASE	N. S.	Non sig increase in INT
		ADJ THER	RES				

Study	Subjects	POP[a]/Goal	Length/DUR[b]	Components	Philosophy	ASSESS[c]	Results
Fersch &	N=176	NON-	9 months	RC, INIT,	ACT	I. E.	Non sig

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Study	Subjects	POP[a]/Goal	Length/DUR[b]	Components	Philosophy	ASSESS[c]	Results
Smith (1972)	14-16yo	CLIN		ROCK, WATER, RUN			increase in INT
		ED, REC	OUT				
Gaston (1978)	N=100 13-20yo	ADJ	26 days	EXP, BACK, HIKE, ROCK, WATER	EXP	N. S.	Sig increase in INT
		PRIM THER					
Gillis (1981)	N=11 10-15yo	NON-CLIN	9 days	PLAN, INIT, RUN	BASE	I. E.	Sig increase in INT
		ED, REC	MIX				
Langsner & Anderson (1987)	N=14 M 9-13yo	CLIN	5 days	INIT, RC, PLAN, CAMP	BASE	N. S.	Non sig increase in INT
		PRIM THER	MIX				
Marsh, Richards & Barnes (1986)	N=361 16-31yo	NON-CLIN	26 days	HIKE, ROCK, WATER, RUN	EXP	I. E.	Sig increase in INT
		DEVEL	RES				
Minor & Elrod (1994)	N=7 N=22 12-17yo	ADJ	10 days	RC, ROCK, CAMP	BASE	N. S.	•Non sig decrease •Non sig inc
		PRIM THER	MIX				
Nowicki & Barnes (1973)	N=261 11-14yo	NON-CLIN REF	1 week	REC, WATER, SS	BASE	N. S.	Sig increase in INT
		DEVEL	RES				
Parker (1992)	N=24 N=13 12-18yo	•NON-CLIN REF •CLIN	2 days	RC, ROCK	ACT	N. S.	Non sig increase in INT
		ADJ THER	OUT				
Powers	N=18	NON-	5 days	SS,	BASE	I. E.	Sig

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(1983)	18-51yo	CLIN		CAMP, INIT			increase in INT
		DEVEL	RES				
Richards, Van Gelder & Neill (1994)	N=66 Xage= 22.5	NON-CLIN	26 days	EXP, SOLO, ROCK, BACK, WATER, CAVE, SS, PLAN, SERV, RUN	EXP	I. E.	Non sig increase in INT
		DEVEL	RES				
Sakofs & Schuurman (1991)	N=57 13-18yo	ADJ	24 days	HIKE, SS, CAMP, INIT, CAVE, SERVE	BASE	N. S.	Non sig increase in INT
		ADJ THER	RES				
Shasby, Henchbert & Gansneder (1984)	N=137 7-15yo	NON-CLIN REF	21 days	CAMP, REC	BASE	N. S.	Sig increase in INT
		DEVEL	RES				
Stremba (1977)	N=11 Xage= 18.9	NON-CLIN	23 days	EXP, SOLO, CAMP, BACK, ROCK, SS, PLAN, RUN	EXP	I. E.	Non sig increase in INT
		DEVEL	RES				
Taylor (1989)	N=21 18-23yo	NON-CLIN	15 weeks	RC, ROCK, WATER	ACT	I. E.	Non sig increase in INT
		ED	OUT				

Study	Subjects	POP[a]/Goal	Length/DUR[b]	Components	Philosophy	ASSESS[c]	Results
Ulrey	N=21	NON-	2 weeks	INIT, RC	BASE	N. S.	Sig

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(1974)	N=24 N=23 N=15 8-10yo	CLIN					increase in INT
		REC	RES				
Wright (1982)	N=35 Xage= 16.5	ADJ	26 days	EXP, SOLO, BACK, ROCK, WATER, CAVE, SERVE, SS, RUN	EXP	I. E.	Sig increase in INT
		PRIM THER	RES				
Ziven (1988)	N=24 12-18yo	CLIN	8 months	INIT	ACT	N. S.	Sig increase in INT
		ADJ THE	MIX				
Zwart (1988)	N=43 14-17yo	ADJ	26 days	EXP, BACK, SOLO, HIKE, ROCK, CAVE, WATER, SS, PLAN	EXP	N. S.	Non sig increase in INT
		ADJ THER	RES				

Note. In cases where more than on e N is listed under a particular study, these groups were run

independently and data calculated separately. Additionally, if characteristics differed between

these data sets, this was respectively noted by the use of bullets. The charted lengths reflect the

duration of adventure components or activities (they do not always equal entire program length).

 Studies that were 26 days in length were standard Outward Bound courses. Subjects: N=

number of subjects in study (control groups were not included if they did not involve an

adventure component), Xage= mean age of participants. POP's: NON-CLIN= non-clinical,

NON-CLIN REF= non-clinical referred, ADJ= adjudicated, CLIN= clinical. GOALS: REC=

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recreation, ED= education, DEVEL= developmental, PREV= prevention, ADJ THER=

adjunctive therapy, PRIM THER= primary therapy. DUR: RES= residential only, MIX=

residential plus outpatient, OUT= outpatient only. Components listed are reported study

components. EXP= expedition, PLAN= participant planning stage, SS= survival skills, BACK=

backpacking, INIT= initiative activities, SOLO= solo component, RC= ropes course, ROCK=

rock climbing, CAVE= caving, CAMP= camping, WATER= water activity (canoeing, kayaking,

white-water), REC= traditional recreational camp activities, RUN= a purely physical (low skill)

component (e.g. marathon, aerobics), HIKE= day long hike, SERV= community service project.

 Philosophy: BASE= base camp, ACT= activity based, EXP= expedition based. Assessment: N.

S.= Nowicki-Strickland LOC, I. E.= Rotter Internal-External LOC. INT= internality, EXT=

externality.

[a] POP= population

[b] DUR= duration

[c] ASSESS= LOC assessment

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Appendix C

Moderator Variables and Their Frequencies

Moderator Variable	Frequency
1) <u>YEAR</u>	
1: 1970'S	8
2: 1980-1985	6
3: 1986-1989	9
4: 1990'S	7
2) <u>SAMPLE SIZE</u>	
1: <15	6
2: <25	9
3: 33-80	11
4: 135-361	4
3) <u>POPULATION</u>	
1: Non-clinical	13
2: Non-clinical Referred	5
3: Adjudicated	9
4: Clinical	3
4) <u>GOAL</u>	
1: Recreation	4

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Moderator Variable	Frequency
2: Education/Development/Prevention	12
3: Adjunctive Therapy	8
4: Primary Therapy	6
5) LENGTH	
1: < 1 wk	6
2: < 1 month	15
3: > 1 month	9
6) PHILOSOPHY/UNDERPINNING	
1: Base camp	15
2: Expedition based	8
3: Activity based (short term)	7
7) LOC ASSESSMENT	
1: Rotter (I. E.)	11
2: Nowicki-Strickland (N. S.)	19
8) DAILY DURATION	
1: Pure residential (RES)	17
2: Mix	8
3: Out-patient (OUT)	5

(table continues)

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Moderator Variable	Frequency
9) AGE	
1: <20 yrs	23
2: <32 yrs	6
3: <52 yrs	1
10) SAMPLE GENDER	
1: Female	1
2: Male	3
3: Coed	26
11) NUMBER OF COMPONENTS	
1: 1-2	10
2: 3-4	11
3: 5-7	4
4: >7	5
12) TRANSFER OF SKILLS	
1: Direct	11
2: Indirect	19
13) PHYSICAL FITNESS ACTIVITIES COMPONENT	
1:Yes	8

(table continues)

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Moderator Variable	Frequency
2: No	22
14) <u>MODIFIED LOC ASSESSMENT</u>	
1: Yes	26
2: No	4

<u>Note.</u> The frequency values represent the number of studies falling under that category.

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Appendix D

Quantitative Analyses of Adventure Programs

Author	No. Studies	Overall Results	Locus of Control
Burton (1981)	161 studies	38% mostly positive 26% some positive 34% non-sig 2% negative	N= 8 mostly= 3 (37%) some= 1 (12%) non-sig= 4 (50%)
Cason & Gillis (1993)	43 studies 235 effect sizes	Effect Size= 0.31	N= 13 Effect Size= 0.30
Hattie, Marsh, Neill & Richards (1997)	96 studies 1728 effect sizes	Effect Size= 0.34	N= 16 Effect Size= 0.30
Hans (current research)	24 studies 30 effect sizes	not applicable	N= 30 Effect Size= 0.38

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Author Note

Tracy A. Hans, Department of Psychology graduate student, Georgia College & State University, 1997. Currently Clinical Coordinator at Bonnie Brae Residential Treatment Center, Liberty Corner, NJ.

Correspondence concerning this article should be addressed to Tracy Hans, 618 Garden St, Apt A, Hoboken, New Jersey 07030. Electronic mail may be sent via Internet to Thans2@aol.com

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Footnotes

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Table 1

<u>Summary of Study-Level Effect Sizes</u>

Criterion	Value
<u>n</u>	24
N	30
Mean unweighted effect size ($\underline{d}$)	0.38
95% CI for $\underline{d}$	0.30 / 0.43
Mean weighted effect size ($\underline{d}_+$)[a]	0.36
95% CI for $\underline{d}_+$	0.31 / 0.45
<u>Homogeneity statistic for $\underline{d}_+$; ($Q_{(29)}$)</u>	41.16[b]

<u>Note.</u> The effect size represents the standard difference between the pre and post LOC assessments; a positive score indicates movement toward internal orientation. <u>n</u> = the number of studies included in the overall analysis; N = the number of effect sizes included in the overall analysis; CI= confidence interval.

[a]Effect sizes were weighted by the reciprocal of the sample variance.

[b]Non-significant- indicates acceptance of the homogeneity hypothesis.

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Table 2

Study-Level Effect Sizes

Study	N	Effect Size[a]	95% CI
Gillis (1981)	11	1.20	0.29/2.11
Ziven (1988)	24	1.15	0.54/1.77
Callahan (1989)	35	0.92	0.43/1.42
Gaston (1978)	100	0.70	0.42/0.99
Wright (1982)	35	0.84	0.35/1.33
Ulrey (1974)	21	0.52	-0.07/1.10
Powers (1983)	18	0.50	-0.17/1.16
Marsh et al. (1986)	361	0.49	0.35/0.64
Ulrey (1974)	15	0.44	-0.13/1.01
Ulrey (1974)	24	0.43	-0.29/1.16
Ulrey (1974)	23	0.37	-0.24/0.98
Nowicki & Barnes (1973)	261	0.36	0.19/0.54
Parker (1992)	24	0.36	-0.21/0.93

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Doyle- prep (1981)	17	0.33	-0.35/1.01
Elstad (1989)	5	0.32	-0.93/1.56
Richards et al. (1994)	66	0.32	-0.03/0.66
Stremba (1977)	11	0.31	-0.53/0.15
Sakofs & Schuurman (1991)	57	0.27	-0.10/0.64
Anderson & Nelson (1995)	33	0.25	-0.24/0.73
Shasby et al. (1984)	137	0.22	-0.02/0.46

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Study	N	Effect Size[a]	95% CI
Langsner & Anderson (1987)	14	0.21	-0.53/0.95
Doyle- prep/exp (1981)	18	0.20	-0.45/0.86
Minor & Elrod (1994)	22	0.20	-0.40/0.79
Davis-B. & Berman (1989)	23	0.19	-0.39/0.77
Fersch & Smith (1972)	176	0.18	-0.02/0.39
Parker (1992)	13	0.14	-0.63/0.91
Zwart (1988)	43	0.06	-0.36/0.49
Taylor (1989)	21	0.06	-0.55/0.66
Corsica (1987)	17	-0.29	-0.96/0.39
Minor & Elrod (1994)	7	-0.31	-1.36/0.75

Note. The effect size represents the standard difference between the pre and post LOC assessments; a higher score indicates a higher degree of change toward internality for that study. N = the number of subjects in each study. CI = confidence interval.

[a]Effect sizes were weighted by the reciprocal of the sample variance.

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Table 3

Effect Sizes for Categorical Models

Variable	Qb[a]	ES[b]	CI	Qw[a]
Year	2.76			
1970'S		0.38	0.26/0.49	8.53
1980-1985		0.37	0.19/0.56	8.75
1986-1989		0.44	0.32/0.57	19.63
1990'S		0.26	0.07/0.44	1.48
Sample size	1.34			
<15		0.32	-0.04/0.68	5.26
<25		0.31	0.10/0.52	11.76
33-80		0.35	0.23/0.48	12.91
135-361		0.42	0.32/0.51	9.89
Population	3.98			
Non-clinical		0.39	0.28/0.49	10.62
Non-clinical Referred		0.31	0.18/0.44	1.24
Adjudicated		0.44	0.28/0.59	21.17
Clinical		0.72	0.28/1.16	4.15
Goal	7.97*			
Recreation		0.44	0.13/0.75	0.11

(table continues)

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Variable	Qb^a	ES^b	CI	Qw^a
Ed/Devel/Prev	0.35		0.26/0.43	15.27
Adjunctive Therapy		0.30	0.12/0.49	9.13
Primary Therapy		0.64	0.44/0.83	8.68
Length	5.22			
< 1 wk	0.32		0.18/0.48	3.40
< 1 month		0.45	0.36/0.54	22.83
> 1 month		0.26	0.10/0.41	9.15
Philosophy	4.42			
Base camp		0.31	0.20/0.42	10.50
Expedition based		0.47	0.36/0.58	10.80
Activity based		0.34	0.18/0.50	15.44
Assessment	0.83			
Rotter	0.42		0.32/0.52	18.42
Nowicki-Strickland		0.35	0.25/0.45	21.91
Daily duration	6.09*			
Pure residential		0.40	0.32/0.48	19.18
Mix		0.53	0.30/0.76	15.18
Out-patient		0.20	0.02/0.37	0.70

(table continues)

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Variable	Qb[a]	ES[b]	CI	Qw[a]
Age	0.96			
<20 yrs		0.36	0.28/0.44	37.00
<32 yrs		0.43	0.30/0.56	3.21
<52 yrs		0.50	-0.17/1.16	0.00
Sample gender	0.21			
Female		0.50	-0.17/1.16	0.00
Male		0.36	0.19/0.52	0.16
Coed		0.38	0.31/0.46	40.79
Components	0.92			
1-2		0.36	0.20/0.51	9.03
3-4		0.39	0.29/0.50	12.70
5-7		0.34	0.19/0.49	8.54
>7		0.45	0.25/0.66	9.96
Transfer of Skills	0.08			
Direct		0.37	0.25/0.48	11.56
Indirect		0.39	0.30/0.48	29.51
Physical Fitness	0.03			
Yes		0.37	0.22/0.52	15.03
No		0.38	0.31/0.46	26.10

(table continues)

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Variable	Q_b[a]	ES[b]	CI	Q_w[a]
Modification	3.08			
Yes		0.36	0.29/0.44	30.87
No		0.63	0.34/0.92	7.21

Note. The effect size represents the standard difference between the pre and post LOC

assessments; a higher score denotes a higher degree of change toward internality. An asterisk

signifies a significant moderating variable. QB = between-category homogeneity statistic; ES =

effect size; CI = confidence interval; Qw = within-category homogeneity statistic.

[a]Significance of either homogeneity statistic indicates rejection of the hypothesis of

homogeneity.

[b]Effect sizes were weighted by the reciprocal of the sample variance.

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i. There are many related educational terms and philosophies that involve 'learning by

doing' (e.g., Teaching for Conceptual Change, Cooperative Learning, Discovery Learning).

Specific to Experiential Education philosophy is the incorporation of distinct (reflective)

techniques and models of learning. Furthermore, Experiential Education usually involves the

outdoors, makes use of metaphor, and takes place in small groups.

ii. Burton examined outcomes such as recidivism, self-concept, LOC, self-assertion, personality, GPA, observed behavior, school functioning and absenteeism.

iii. Cason examined outcomes such as self-concept, attitude surveys, participant grades and school attendance, behavioral ratings by others, and clinical scales.

iv. Outcome measures were coded under six dimensions: academic, leadership, self-concept, personality, interpersonal, and adventuresome.

v. The highest effect sizes were independence, confidence, self-efficacy, self-understanding, assertiveness, LOC and decision-making, respectively.