

DISSERTATION

WILDERNESS THERAPY PROGRAMS FOR JUVENILE DELINQUENTS:

A META-ANALYSIS

Submitted by

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

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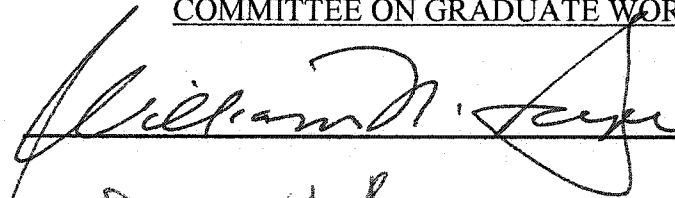
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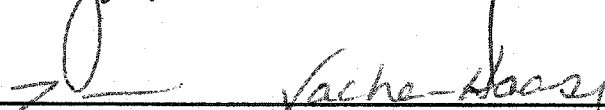
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## ABSTRACT

### WILDERNESS THERAPY PROGRAMS FOR JUVENILE DELIQUENTS:

#### A META-ANALYSIS

Wilderness Therapy outcome studies were analyzed using meta-analysis to determine if these programs are more effective than traditional means of rehabilitation for delinquent adolescents. Moderate effect sizes in favor of Wilderness Therapy Programs were found with respect to enhancing self-esteem/self-concept and improving interpersonal skills and promoting behavior changes. A small effect size was found with respect to reducing recidivism. Overall results suggested Wilderness Therapy Programs are more effective than traditional means in terms of rehabilitating juvenile delinquents.

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## CHAPTER I

### Introduction

In 1998, almost two million people under the age of 18 were arrested, accounting for 18% of all arrests in the United States. Although recent reports indicate that there are fewer arrests of juvenile delinquents for violent crimes, and that juveniles account for a decreasing percentage of total arrests, the overall number of juvenile arrests is increasing by alarming rates: In 1998, there were almost 1.9 million juveniles arrested, up from 1.4 million in 1997 (Crime in the United States, 1999). Of the 1.4 million juveniles arrested in 1997, 67% were referred to the juvenile court jurisdiction, an additional 15% were handled within the police department and released, and 7% were referred to criminal or adult court (Sourcebook of Criminal Justice Statistics, 1998). Given that almost a million cases were referred to the juvenile courts each year for the past several years, it is important to determine the effectiveness of programs serving juvenile delinquents.

Indeed, the effectiveness of programs that serve juvenile delinquents has come under scrutiny. A 1990 meta-analysis of juvenile and adult corrections indicated that programs were not preventing repeat offenses from “rehabilitated” criminals (Andrews, Zinger, Hoge, Bonta, Gendreau, & Cullen, 1990). Andrews et al. (1990) wrote, “Neither criminal sanctioning without provision of rehabilitative service nor servicing without reference to clinical principles of rehabilitation will succeed in

reducing recidivism.” (p. 369). Andrews et al. (1990) concluded that delivery of appropriate correctional services would reduce recidivism. They supported three specific changes to current distribution of services: (a) delivery of services to higher risk cases, (b) targeting the criminogenic needs of this population, and (c) using styles and modes of treatment (specifically cognitive and behavioral) that are matched with the client needs and learning styles (Andrews et al., 1990).

A lengthy critique of the above meta-analysis by Lab and Whitehead (1990) found Andrews et al.'s (1990) suggestions to be lacking in applicability. Lab and Whitehead (1990) indicated that Andrews et al. (1990): (a) did not recognize the personnel limitations of their proposal-additional cases on a budget that is already under funded would be detrimental for both staff and clientele, (b) did not provide treatment for low-risk criminals, and (c) included only the studies with a family counseling component, but then concluded that the recommended treatment was cognitive-behavioral in nature, exclusive of family counseling. In sum, Lab and Whitehead (1990) indicated that the recommendations from Andrews et al. (1990) were not realistic to implement, the treatments were not comprehensive, some treatment modalities that have been proven effective in the past had been eliminated, and treatment was not provided to those at a lower risk of recidivism.

Wilderness therapy is one alternative treatment for juvenile delinquents that has been examined since the 1960s. Wilderness therapy programs, similar to the original Outward Bound programs, are on the rise, both in numbers of programs and number of people served (Davis-Berman & Berman, 1993; Roberts, 1987). However,

despite the growing popularity of wilderness therapy, the literature is unclear as to whether these programs are effective.

### *Wilderness Therapy*

An increasing number of wilderness programs are being offered both to juvenile delinquents as well as to the general public (Davis-Berman & Berman, 1993; Roberts, 1987). As evidenced by the literature, the programs differ on a number of variables, including intensity, duration and the number of participants.

Although many studies have examined wilderness therapy, few have focused specifically on juvenile delinquents. Further, many of the studies in this area are unpublished dissertations. Results have been mixed, with some studies indicating a reduction in recidivism for up to five years (Bear, Jacobs, Carr, 1975), while other studies have found that wilderness therapy is no better than current treatments (Chiles Jr., 1984; Elrod and Minor, 1992; Weeks, 1984), or is in fact worse for juvenile delinquents (Wright, 1983; Zwart, 1988).

Outward Bound is an excellent example of a wilderness therapy program. The major thrust of wilderness programs is helping participants test their own limits and find new levels of capabilities. Nold and Wilpers (1975) provide an apt description:

“The essence of ‘wilderness therapy’ is in this experience: challenge, the overcoming of a seemingly impossible task, the confrontation of feat, a success of experience. It is an opportunity to gain self-reliance, to prove one’s worth, to define one’s manhood. The results are immediate. The task is clear, definable, unavoidable.” (p. 155).

Outward Bound was initially established to prepare merchant seamen for battle. Kurt Hahn developed this program to enhance independence, self-reliance, physical fitness, and resourcefulness. The ideas appealed to organizations other than seamen, and Outward Bound spread to many countries, including the United States (Kimball, 1980).

Outward Bound and similar courses are available for adults and youth, and special programs are designed for juvenile delinquents. Courses include physical and psychological challenges such as rock climbing, canoeing, and caving. Courses are typically limited to 12 participants and two or three instructors. Four basic concepts are stressed throughout the course: (a) physical conditioning such as running and hiking, (b) technical training, including the use of tools and equipment such as the cook stove, how to pitch a tent, map reading and life saving skills, (c) safety training, focusing on the specific safety skills needed for activities, and (d) team training, including rescue techniques and evacuation. A three-day solo experience allows participants the opportunity to demonstrate skills, an opportunity to challenge dependence on companionship, and a time to test the rules as an individual. Provided with minimal equipment (e.g., knife, first aid kit, two quarts of water and a nine foot square plastic sheet), the participant must fend for him or herself in the wilderness. This is intended to create an opportunity for self-appraisal as well as a self-test of skills and independence.

Kelly and Baer (1968) have speculated that Outward Bound programs may provide at least three significant benefits for juvenile delinquents. First, the immediacy and concreteness of the task at hand (e.g., climbing a rock face) is evident,

and it is equally clear, to both the participant and other group members, when the task has been accomplished. Second, several of the tasks require persistence, a trait that Kelly and Baer believe many juvenile delinquents do not possess. In their view, while struggling to summit the mountain, participants learn persistence and perseverance. Third, Kelly and Baer believed collaboration was a skill most delinquents learned during the course. For example, one of the first and more difficult lessons that some students learn is to share food with group members.

However, Kelly and Baer (1968) also identified drawbacks of wilderness therapy for juvenile delinquents. First, many of the delinquents are physically out of shape and find these wilderness challenges to be extremely tiring. Some participants view Outward Bound courses as an alternative type of punishment and fail to see the potential for learning life lessons. Juvenile delinquents with this attitude may respond better to traditional forms of punishment and rehabilitation. In addition, the discrepancy between the Outward Bound experience and home life may create difficulties as students try to apply lessons learned in the wilderness to everyday challenges. Finally, after-care is limited, and finding someone to help make the associations between lessons learned in the wilderness and applications in everyday life can be a challenge (Kelly & Baer, 1968).

*Wilderness therapy: Reducing delinquency and recidivism*

A major goal of rehabilitating juvenile delinquents through wilderness therapy is to reduce the risk of future offenses. The classic study marking the beginning of research in this field was a two-year project by Kelly and Baer (1968). Of the 120 participants, half of the boys completed an Outward Bound course, the other half

completed traditional parole. After one year, the boys who had completed the Outward Bound course had a 20% recidivism rate compared to the traditional parole group with a 37% recidivism rate. Furthermore, Outward Bound participants had committed fewer crimes, the crimes were less serious, and less time was spent in detention. Another study by Baer examined the long-term effects of an Outward Bound course and recidivism (Baer, Jacobs, Carr, 1975). A significant association was found between non-recidivism during a five-year period and successful completion of an Outward Bound course.

More recent studies have examined shorter follow-up periods upon completion of a wilderness course. Castellano and Soderstrom (1992) found a one-year delinquency reduction effect, but this effect was not evident at the two-year follow-up. A study by Plouffe (1981) indicated that six months after wilderness therapy participants exhibited less deviant behavior, felt more in control of their environment, and had increased self-confidence and self-control. Gaston, Plouffe, and Chinsky (1978) reported that wilderness therapy enhanced skills related to reduced recidivism, including improved problem solving skills, positive changes meeting challenges, increased ability to control tempers. In addition, participants had a lower frequency of deviant behavior during the six month follow-up period (Gaston, Plouffe, & Chinsky, 1978).

#### *Wilderness therapy: Other Benefits for Juvenile Delinquents*

Wilderness therapy may have benefits for juvenile delinquents in addition to reducing recidivism. Kelly and Baer (1969) found Outward Bound participants to have more favorable social attitudes and a more positive evaluation of feelings upon

completion of the course. Kelly and Baer concluded that Outward Bound was a desirable short-term means of promoting positive change in the social attitude and self-concept of male delinquents. They believed their results supported the Outward Bound principle

“A young man should not just be told that he is capable of more than he thinks he can do, but rather a set of circumstances must be devised in which he demonstrates such competence to himself” (p. 719).

Several other studies (e.g., Gibson, 1981; Pommier & Witt, 1995; Rice, 1988; Wright, 1982) have replicated Kelly and Bear's (1969) findings, concluding that wilderness therapy has the ability to enhance self-esteem and self-concept in juvenile delinquents.

Relationships with family members and peers have also been examined with respect to wilderness therapy with juvenile delinquents. It has been found that wilderness therapy can improve these relationships (Gibson, 1981), but that these benefits typically “wear-off” after four to six months (Pommier & Witt, 1995; Winterdyk & Reosch, 1982).

Finally, personality changes have been documented following wilderness therapy experiences. Using the Minnesota Multiphasic Personality Inventory (MMPI), Gillis and Simpson (1991) found that after engaging in wilderness therapy, participants had decreased evidence of depression, obsessive-compulsive behavior, disorganized thinking, manic excitement, and anxiety as well as a demonstrated increase in ego-strength.

### *Wilderness Therapy: Comparison with Traditional Probation*

Some studies have found wilderness therapy and traditional probation to yield similar outcomes for subsequent delinquency and recidivism. Elrod and Minor (1992) found a reduction in criminal offenses over a two-year period, but the three-day wilderness program was no more effective than traditional probation with respect to reducing recidivism. Examining a shorter follow-up period and a more elaborate program, it was found that a comprehensive wilderness therapy expedition that included job preparation, outdoor experiential opportunities, and family skill building did not yield better results than traditional probation at an 18 month follow-up (Elrod & Minor, 1990). In a study by Chiles Jr. (1984), half of the participants engaged in a wilderness therapy program while half were sent to a traditional juvenile corrections facility. Six months after completion of the program, no differences were found between the groups on the number of offenses, nor the severity of the offenses. At the two-year mark, those in the correctional facility had a higher rate of total offense severity and property violations; there were no differences in the number of offenses. Furthermore, the participants of the wilderness therapy group had more traffic violations (Chiles, Jr., 1984). In another study (Weeks, 1984), participants of a traditional probation program and a wilderness therapy group had similar declines in the rate of criminal activity at a three-month follow-up. In addition, both groups had an improvement in grades and a decrease in the number of discipline remarks from teachers. However, the wilderness treatment program was better than the traditional program at reducing the number of absences from school, increasing self-esteem and improving interpersonal effectiveness of the participants (Weeks, 1984).

Zwart (1988) found that wilderness therapy participants and delinquents who completed traditional probation did not differ on self-concept, locus of control, or interpersonal need. However, it was found that the traditional probation participants had enhanced self-esteem relative to wilderness therapy participants. This finding runs counter to much of the previous research regarding wilderness therapy and self-esteem.

Another surprising finding was in problem solving skills. Wright (1983) found that the participants of a wilderness therapy group had increased scores on self-esteem, self-efficacy and locus of control measures, but “showed no gain at all in problem-solving skills” (p. 33). Wright later questioned the validity of his problem-solving measures, but recommended that programs teach problem solving skills verbally as well as experientially.

#### *Wilderness Therapy: Aftercare*

Only one study has examined the impact of after-care with respect to treatment with a wilderness component. A recent study (Deschnes & Greenwood, 1998) of a three-month residential and outdoor challenge program placed juvenile delinquents in a rural setting, and was followed by nine months of intensive community-based aftercare. This program was not considered wilderness therapy in that modern conveniences such as housing, running water and electricity were provided. However, this study is important in terms of cost effectiveness: while both the traditional probationers and the rural participants gained in social adjustments, the rural program was significantly more cost effective. Unfortunately, the social adjustment effects for both groups disappeared by the end of the 24 month follow-up

period. Recommendations from the study included the continued use of intensive after-care, and encouraged plans for after-care to be strengthened by finding from current research. This is the only study that links juvenile delinquents with a rural experience and the need for intense after-care.

#### *Wilderness Therapy: Summary*

Reducing recidivism is a major goal of programs for juvenile delinquents. Early research indicated that wilderness therapy had a major advantage over traditional probation programs, and the reduced rates of subsequent offenses lasted for as long as five years. More recent research has found mixed results, with some studies finding that wilderness programs are no more effective than traditional probation, and other studies finding wilderness programs impacting recidivism for four to six months before “wearing off.”

In general, wilderness therapy programs seem to have a positive impact on self-esteem and self-concept, enhanced relationships with family members and peers, and positive personality changes. Results are less clear with respect to reducing juvenile delinquency.

#### *Meta-analysis*

Meta-analysis is the quantitative review and synthesis of research issues examining similar research questions. A meta-analysis avoids the difficulties of a traditional literature review for several reasons. First, literature reviews are often based on the selective inclusion of studies, influenced by the reviewer’s impressionistic view of the quality of the study. In addition, differential subjective weightings of studies can bias the interpretation of a set of findings. Another

limitation of traditional literature reviews is that they may offer misleading interpretations of study findings. Finally, traditional literature reviews are often biased toward “positive” findings in published venues.

By contrast, a meta-analysis relies on the outcomes or results of each study, transforming the statistical results into a common metric across studies (the effect size), thereby determining the “effectiveness” of the treatment. It is important to note that the practical significance may not be related to effect size. With respect to the bias towards “positive” findings, meta-analysts can sidestep these issues by searching for unpublished research (e.g., dissertations) and calculating a “fail-safe n,” or the number of studies required to reverse the findings of the meta-analysis.

A current debate among meta-analysts concerns the inclusion of methodologically poor studies. One interpretation of this controversy is that unless studies meet minimum design criteria (i.e., inclusion of a control group) the studies should be excluded. Others argue that methodologically poor studies may not yield different results and should not be excluded ipso facto. Instead, when possible, the meta-analyst should attempt to assess how methodological factors relate to effect size. In other words, the studies would be coded based on the rigor of the methodology, and effect sizes should be statistically compared to determine if the effect sizes differ (Grimm & Yarnold, 1995).

Another debate among meta-analysts is how to work with studies that provide data to more than one conceptual category. Although including studies in all applicable categories inflates the sample size of statistical tests and effects beyond the number of independent studies, it also increases statistical power. The disadvantage

to this is the increased difficulty in determining the amount of statistical error (Wolf, 1986, p. 44-48). Other sources indicate that studies represented in more than one conceptual category are not a significant issue, and that the loss of valuable information is a greater concern (Grimm & Yarnold, 1995, pp. 331-332).

The basic effect size equation is the difference between the post-treatment scores of the treatment and the control group, divided by the standard deviation of both groups. It is written

$$d = \frac{Tx_{post-tx} - control_{post-tx}}{SD_{tx \& control}}$$

(Grimm & Yarnold, 1995, p. 327). The range of effect sizes has been categorized as follows:  $d=.20$  is a "small" effect size,  $d=.50$  is a "moderate" effect size, and  $d=.80$  is a "large" effect size (Cohen, 1988).

Each study has a unique effect size. Given that many studies do not include an effect size, this can be calculated. When means and standard deviations are not provided, formulas based on results of chi-square, t-tests and analysis of variance can be used. These formulas are as follows:

$$d = \sqrt{\frac{\chi^2}{N}}$$

$$d = t \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

$$d = \sqrt{F \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

where  $N$  is the total number of participants in the study,  $n_1$  is the number of participants the experimental group, and  $n_2$  is the number of participants the control

group. For pre-post data (no control group data available) the following equations can be used:

$$d = \sqrt{F\left(\frac{1}{N}\right)}$$

$$d = t\sqrt{\left(\frac{1}{N}\right)}$$

Rather than simply average the calculated effect sizes, a more sophisticated approach may be used to take into account the number of participants in each study included in the meta-analysis. This approach controls for the studies that included small sample sizes or unrepresentative samples of groups. When the experimental and control group sample sizes are greater than 10 and the effect sizes are less than approximately 1.5, then a weighted average is preferred (Hedges, 1982). This formula is written

$$d = \frac{\sum wd}{\sum w}$$

$$w = \frac{2N}{8+d^2}$$

N is the total sample size for the study, including the experimental and control groups.

Finally, it is recommended that the "fail-safe n" be calculated (Wolf, 1986), that is, the number of studies required to reverse the effect size and make it significant or non-significant. This is done, in part, to take into the account the bias towards submitting and publishing only those studies with "positive" findings. This bias is sometimes referred to as the "file drawer problem" (Wolf, 1986). Given that a

previous meta-analyses of wilderness therapy for juvenile delinquents yielded small effect sizes, an equation for the “fail safe n” for a small effect size is written:

$$N_{fs,2} = \frac{N(d-.2)}{2}$$

where N is the number of studies in the meta-analysis conceptual category (e.g., recidivism) and d is the calculated effect size for that category.

In sum, a unique effect size can be calculated for each conceptual category. Ideally, this effect size would be a weighted average of the effect sizes included in that category. An effect size may be calculated using all studies in the conceptual category, as well as using only those studies with a control group. Statistical tests such as a t-test can be used to determine if the calculated effect sizes differ based on methodological quality. In addition, it is recommended (Wolf, 1986) that the “fail-safe n” based on an anticipated effect size be calculated for each category.

#### *A Recent Meta-Analysis*

A recent meta-analysis by Wilson and Lipsey (2000) examined the effectiveness of wilderness programs serving juvenile delinquents as well as “general youth samples” self-reporting delinquent activities. To meet the inclusion criteria, (a) the study had to involve wilderness challenge programming to reduce or prevent antisocial behavior or delinquency, (b) the participants must have been antisocial or delinquent youth between the ages of 10 and 21, (c) the study must have included a control group, (d) the results of outcome measures must have been quantitative, and (e) the study must have been reported after 1950 and written in English. Twenty-eight studies met the criteria. “Small” (Cohen, 1988) effect sizes were found for

antisocial and delinquency outcomes ( $d=.18$  including all studies, to  $d=.24$  excluding the outliers). The authors found that approximately 29% of wilderness participants engaged in subsequent delinquent activities (as noted by self-report by the participants and/or as documented by the legal system) in contrast to 37% of the control participants. In addition, "small" (Cohen, 1988) effect sizes were also found for "general interpersonal and psychological variables" such as interpersonal adjustment ( $d=.28$ ) and self-esteem ( $d=.31$ ).

### *The Present Study*

The present study employed meta-analytic techniques to more fully examine the effectiveness of wilderness treatment programs with respect to recidivism. In addition, variables such as self-esteem and behavior change have long been thought to impact outcomes of treatment programs for juvenile delinquents (Fannin & Clinard, 1965; Kelly & Baer, 1969). As such, the present study also examined the effectiveness of wilderness treatment programs for juvenile delinquents with respect to enhancing these psychological variables (interpersonal skills/behavior change and self-esteem/self concept).

Similar to the Wilson and Lipsey (2000) study, the present meta-analysis included studies in all appropriate conceptual categories. Eleven studies (48%) were represented in more than one conceptual category, twelve studies (52%) were represented in only one conceptual category. Some studies employed multiple measures to investigate one concept. In the event of multiple measures, an effect size was calculated for each measure, and these effect sizes were be averaged so that each study provided one unique effect size for any given conceptual category.

One significant difference between the Wilson and Lipsey (2000) meta-analysis and the current meta-analysis was the basis of the wilderness treatment programs. Wilson and Lipsey (2000) included studies of programs targeted towards “antisocial or delinquent youth,” including “general youth samples” asked to self-report about delinquent activities. These “general youth samples” are not considered part of the juvenile justice system. Conversely, the present study included only studies with a wilderness treatment component for adjudicated juvenile delinquents (youth that had been adjudicated delinquents by the court system), excluding studies based on “general youth samples.”

Another difference between the current study and the Wilson and Lipsey (2000) study is the inclusion of studies without a control group. Although it is methodologically important to have control groups, the definition of a control group varies by study. For some studies, a control group is a wait-list while the juvenile offender waits in a rehabilitation center, while for other studies it is traditional probation. Further, statistics available for meta-analysis are often presented in a pre-test/post-test format rather than a treatment vs. control format. Recognizing that the presence of a control group does not indicate that only between-group statistics will be used for meta-analysis, and that the definition of a control group varies a great deal, the present study examined studies with control groups as well as non-controlled studies. (In fact, four of the twenty-three studies that met the inclusion criteria for the proposed study present results in a pre-post format for one concept and results for control vs. treatment with respect to a different concept.)

In sum, the current meta-analysis included all studies that meet the criteria without evaluation of methodological quality. In addition, an analysis of only the studies with control groups was also conducted. The effect sizes from all studies were compared with the effect sizes from studies with control groups to determine if methodological quality impacted the results of the assessment of the effect sizes. A fail-safe  $n$  was calculated based on an anticipated "small" effect size.

Because the eligibility criteria differ, the current study included some studies that were not included in the Wilson and Lipsey (2000) meta-analysis and excluded some studies that were included in Wilson and Lipsey's meta-analysis. For example, including groups without a control group allowed the inclusion of more studies while limiting the studies to those with adjudicated juvenile delinquents (not "general youth samples") decreased the number of available studies. In addition, a more limited definition of recidivism was used in the current study. In the current study, recidivism was defined as contact with the police and/or legal system. Conversely, Wilson and Lipsey (2000) included self-report of delinquent activities. The more strict definition of recidivism used in the current study allowed for the inclusion of fewer studies than Wilson and Lipsey's (2000) definition would have allowed.

#### *Research Question*

The current meta-analysis was intended to answer the following question: Is wilderness therapy more effective in rehabilitating juvenile delinquents than traditional measures such as incarceration and probation? Effectiveness of wilderness treatment programs were assessed based on three conceptual categories: improved

interpersonal skills and behavior change, enhanced self-esteem and/or self-concept,  
and a reduction in recidivism.

## CHAPTER II

### Method

#### *Description of Studies*

Three inclusion criteria were established for the meta-analysis:

- 1) Studies must have included a wilderness experience component, defined as time spent in an unfamiliar wilderness context where modern conveniences (electricity, running water, cabins, etc.) are not available.
- 2) Studies must have been experimental, not anecdotal, and must include quantitative data related to behavior change/interpersonal skill, self-esteem/self-concept, and /or recidivism that had been statistically analyzed. Studies must include identified measures and data to accompany the measures. The measures may be based on objective or self-report data. To be included in the current study, the data must have included means and standard deviations or provide results from an analysis of variance, chi square or t-test. Simply indicating that results "were not statistically significant" excluded studies because an effect size could not be calculated with just this information.
- 3) The study must have focused on adjudicated juvenile delinquents. The participants must be between 10 and 18 years of age.

### *Sample*

A comprehensive search of ERIC, PsychLit, Sociofile, Agricola, Bibliofile, and Dissertation Abstracts and the use of references from recent meta-analysis articles yielded more than 200 articles related to wilderness therapy. Of these studies examining wilderness therapy, 23 studies met the inclusion requirements described above (see Table 1). The 23 studies yielding 37 effect sizes were composed of 3 masters theses, 11 doctoral dissertations, and 9 published articles. None of the published articles are products of theses or dissertations. One article was completed in the 1960's, seven in the 1970's, eleven in the 1980's, and four in the 1990's. Seven studies (30%) have 50 or fewer participants, the remaining 16 studies (73%) had up to 266 participants.

Eight studies included data related to interpersonal skills and behavior change. These studies measured interpersonal skill and behavior change through the use of instruments completed by parents, teachers, or wilderness therapy staff (Coopersmith Behavior Rating Form, Eyberg Child Behavior Inventory, Peterson Quay Behavior Problem Checklist, Revised Behavior Problem Checklist) as well as objective measures such as the number of discipline referrals within the school system. Sixteen studies provided data regarding changes in self-esteem and self-concept. These studies employed self-report measures as well as instruments completed by adults in the adolescent's life. These measures included the Battle Culture-Free Self-Esteem Scale, Jesness Inventory, Piers Harris Childrens Self-Concept Scale, Rosenberg Self-Esteem Scale, and the Tennessee Self-Concept Scale. In the current study, thirteen studies provided data for recidivism, defined as contact with the police or juvenile

justice system after participating in the wilderness treatment program. Self-report data regarding delinquent activities was not used in this meta-analysis.

All of the analyses were based on data from a treatment versus control or a pre-post design. There were too few studies that included follow-up data to allow for a meta-analysis of follow-up information.

## CHAPTER III

### Results

#### *Behavior Change/Interpersonal Skill*

An effect size for behavior change/interpersonal skill was calculated using all the applicable studies and then only the studies with control groups that provided data. For the eight studies that met the inclusion criteria, the calculated effect size was  $d=.5023$ , for the five studies with a control group the effect size was  $d=.5226$  (see Table 1). Using the effect sizes for each individual study, a t-test was used to determine if the effect sizes differed. The calculated effect sizes did not differ statistically,  $t=-.837$ ,  $df=6$ ,  $p=.434$ ,  $d= -.2321$ . Results of the t-test suggested there was no difference in calculated effect size based on methodological quality.

The fail-safe n for behavior change/interpersonal skill based on all eight studies was 12.09 (see Table 1). In other words, approximately twelve studies with opposite (wilderness therapy is harmful) or neutral (wilderness therapy was no more effective than traditional treatments) results would be required to reverse the findings of this meta-analysis. The fail-safe n is calculated using the average effect size, the expected effect size, and the number of studies in the conceptual category. Because the average effect size was so large, the fail-safe n is larger than the number of studies included in the conceptual category. A fail-safe n that is larger than the number of studies is not unexpected given the average effect size, and is found for other results

in this study. For example, using only the five studies with control groups, the fail-safe  $n$  was 8.06, or approximately eight studies with opposite or neutral findings would be required to reverse the findings of the current meta-analysis.

#### *Self-Esteem/Self-Concept*

An identical method was used to calculate the effect sizes for self-esteem/self-concept. Using all of the sixteen studies that met the inclusion criteria, the effect size was  $d=.5395$ , including only the nine studies with a control group, the effect size was  $d=1.5187$ . Results of a  $t$ -test indicated there was no statistical difference between these two calculated effect sizes,  $t=-.460$ ,  $df=23$ ,  $p=.650$ ,  $d=.289$ .

The fail-safe  $n$  for self-esteem/self-concept based on all sixteen studies was 27.16 (see Table 1). In other words, approximately twenty-eight studies with opposite (wilderness therapy is harmful) or neutral (wilderness therapy was no more effective than traditional treatments) results would be required to reverse the findings of this meta-analysis. Using only those nine studies with control groups, the fail-safe  $n$  was 59.34, or approximately sixty studies with opposite or neutral findings would be required to reverse the findings of the current meta-analysis.

Based on a scatter plot analysis, one study (Callahan, 1989) was considered an outlier. Recalculating the effect size for all fifteen remaining studies (excluding the outlier) the average effect size was  $d=.5122$ . Once again excluding the outlier, and including only those eight studies with a control group, the calculated effect size was  $d=1.6407$ . Results of a  $t$ -test indicated that based on methodological quality, there was no statistical difference between these two calculated effect sizes,  $t=-.388$ ,  $df=21$ ,  $p=.702$ ,  $d=-.1699$ .

The fail-safe  $n$  was recalculated excluding the outlier. The fail-safe  $n$  for self-esteem/self-concept based on all fifteen studies (excluding the outlier) was 24.98 (see Table 1). In other words, approximately twenty-five studies with opposite (wilderness therapy is harmful) or neutral (wilderness therapy was no more effective than traditional treatments) results would be required to reverse the findings of this meta-analysis. Using only those eight studies with control groups, the fail-safe  $n$  was 64.83, or approximately sixty-five studies with opposite or neutral findings would be required to reverse the findings of the current meta-analysis.

### *Recidivism*

Using the same method, effect sizes were calculated for recidivism. Including all thirteen of the studies that met the inclusion criteria, the effect size was  $d=.3136$ , including only the twelve studies with control groups, the effect size was  $d=.3088$ . Results of a  $t$ -test indicated there was not statistical difference,  $t=.4905$ ,  $df=1$ ,  $p=.3549$ ,  $d=.4214$ .

The fail-safe  $n$  for recidivism for all thirteen studies is 5.11, or approximately five studies with negative or neutral findings would be required to reverse the findings of this meta-analysis (see Table 1). The fail-safe  $n$  including only the twelve studies with control groups was 4.89, or approximately five studies would be needed to reverse the findings of the current meta-analysis.

## CHAPTER IV

### Discussion

The current meta-analysis was intended to answer the question: Is wilderness therapy more effective in rehabilitating juvenile delinquents than traditional measures such as incarceration and probation with respect to improving interpersonal skill and behavior, enhancing self-esteem, and decreasing recidivism. The current meta-analysis found that wilderness therapy is indeed more effective than traditional measures (incarceration and probation) based on these conceptual categories.

Results of the current study indicate that wilderness therapy is a more effective treatment approach for juvenile delinquents than traditional approaches with respect to enhancing behavior change/interpersonal skill and self-esteem/self-concept, and reducing recidivism. Moderate effect sizes were found for behavior change/interpersonal skill and self-esteem/self-concept, and a "small" effect size was found for recidivism.

#### *Behavior Change/Interpersonal Skill*

The effect size for behavior change/interpersonal skill including all eight studies and only those five studies with a control group (indicating high methodological quality) was moderate (Cohen, 1988). One purpose of this meta-analysis was to determine if a wilderness treatment approach is more effective than traditional means for improving behavior and interpersonal skills in juvenile delinquents. Given the moderate effect size, it can be stated that wilderness therapy is

more effective in improving behaviors and enhancing interpersonal skill than traditional treatments such as incarceration and probation.

A fail-safe  $n$  was calculated to determine how many studies with opposite (wilderness therapy is harmful) or neutral (wilderness therapy is not helpful or harmful) findings would be needed to reverse the findings of the current meta-analysis. The results of the fail-safe  $n$  indicate that the finding for behavioral change/interpersonal skill is enduring: with respect to improving behavior and interpersonal skills, wilderness therapy is more effective for juvenile delinquents than traditional measures such as incarceration and many studies would be needed to reverse this finding.

#### *Self-Esteem/Self-Concept*

The effect size for self-esteem/self-concept including all of the studies is considered moderate while the effect size for the studies with a control group would be considered "large" (Cohen, 1988). These effect sizes indicated that wilderness treatment programs are more effective than traditional measures (i.e., incarceration and probation) with respect to enhancing self-esteem and self-concept in juvenile delinquents. In well-designed studies, the effect was stronger than the effect found for all available studies.

A fail-safe  $n$  was calculated to address the "file drawer problem" as well as to determine the strength of the findings. The fail-safe  $n$  indicates that the findings of the current meta-analysis are enduring with respect to self-esteem and self-concept.

### *Recidivism*

As with the previous concepts, an effect size was calculated for recidivism. The current study found a "small" (Cohen, 1988) effect size, but nevertheless a significant finding. Results indicated that wilderness therapy is more effective than traditional approaches such as incarceration and probation with respect to reducing recidivism in juvenile delinquents. A fail-safe  $n$  indicated that the findings for a reduction in recidivism are enduring.

### *Comparison with Wilson and Lipsey (2000)*

Many similarities exist between the current study and Wilson and Lipsey (2000) recent meta-analysis of wilderness treatment programs for juveniles. Both included unpublished studies: Wilson and Lipsey's (2000) sample included 18 (64%) unpublished studies, while the current meta-analysis had 14 (61%) unpublished studies.

Wilson and Lipsey (2000) included eight studies (29%) with 50 or fewer participants. Similarly, the current study had seven studies (30%) with 50 or fewer participants. The majority of the participants were males in both meta-analyses.

Both meta-analyses required that the studies include juvenile delinquents. However, Wilson and Lipsey (2000) extended the age requirements of participants from 10-21, while the current study limited the ages of the participants to 10-18 years of age.

In contrast, Wilson and Lipsey (2000) required that included studies have a control group while the current meta-analysis did not require the presence of a control group. Rather than assume that studies without a control group were not valuable to

the current project, the current meta-analysis calculated the effect sizes for all studies and then calculated the effect size including only those studies with control groups. The effect sizes were compared to determine if methodological quality impacted the calculation of the effect sizes (and found that methodological quality was not related to effect size). Another difference between the two meta-analyses was the targeted adolescent population: Wilson and Lipsey (2000) included a "general youth sample" composed of non-delinquent youth who provided self-reports of delinquent activities while the current study included only those studies with delinquent youth (i.e., part of the juvenile justice system) and did not include self-report data.

Comparing the findings from this meta-analysis to those of Wilson and Lipsey (2000), a stronger effect was found in the current study for all three conceptual categories. Although Wilson and Lipsey (2000) had different inclusion criteria, some studies were included in both meta-analyses. However, given the different inclusion criteria, the data are organized differently between studies. For example, Wilson and Lipsey (2000) grouped "anti-social and delinquent behavior" together, defining documented delinquent behavior as recidivism as well as self-report of delinquent activities that were not detected by law enforcement. Alternately, the current study defined recidivism as delinquent activities that resulted in contact with law enforcement and/or the juvenile justice system.

Wilson and Lipsey (2000) did not categorize behavior change and interpersonal skill together, instead presenting a category of "interpersonal adjustment". The effect sizes from Wilson and Lipsey (2000) for "anti-social behavior and delinquency" and "interpersonal adjustment" are considered "small"

(Cohen, 1988), and the effect sizes from the current study are considered moderate. Although both studies found that wilderness treatment programs were more effective for interpersonal skill/adjustment than traditional means such as incarceration and probation, the results of the current study found a stronger effect than Wilson and Lipsey (2000) found in their meta-analysis.

Similar results were found for both studies regarding self-esteem. Results from the present study found a "medium" effect size compared to results from the Wilson and Lipsey (2000) meta-analysis describe a "small" (Cohen, 1988) effect size for self-esteem/self-concept. Although the findings from Wilson and Lipsey indicate that wilderness therapy is more effective than traditional means with respect to enhancing self-esteem, the findings from the current meta-analysis are stronger.

As described above, Wilson and Lipsey (2000) grouped "antisocial behavior and delinquency" together while the current study used a more strict definition for recidivism. Although this does not allow for a direct comparison between the two studies, some general conclusions can be made. Wilson and Lipsey (2000) reported a "small" effect size for "antisocial behavior and delinquency." This is lower than the calculated effect sizes from the current study, though both of the effect sizes would be considered "small" (Cohen, 1988). Nevertheless, the findings from Wilson and Lipsey (2000) and the current study indicate that wilderness therapy is more effective than traditional measures such as incarceration and probation in terms of decreasing recidivism in juvenile delinquents.

In sum, both the current meta-analysis and Wilson and Lipsey (2000) found that wilderness treatment was more effective than traditional approaches in terms of

rehabilitating juvenile delinquents. However, the current meta-analysis found stronger effect sizes than Wilson and Lipsey (2000) for all three conceptual categories.

One explanation for the discrepancies between the results of the two studies might be the inclusion of studies with poor methodological quality: lack of a control group. While the current study allowed studies that did not present data for a control group, subsequent analyses revealed that methodological quality did not impact the calculated effect size. Thus, it is not likely that the differences between the current study and Wilson and Lipsey (2000) can be explained by the inclusion criteria differences regarding a control group.

Another explanation for the discrepancy in effect sizes might be that the data were categorized differently between studies. For example, behavioral change and interpersonal skill were grouped together in the current study while Wilson and Lipsey (2000) grouped "anti-social behavior and recidivism" together. However, the results of the current meta-analysis were consistently stronger than the results of Wilson and Lipsey (2000), indicating that categorization of data does not fully explain the discrepancy in the strength of the calculated effect sizes.

### *Practical Considerations*

Although the current study found that wilderness treatment approaches are more effective than traditional treatment approaches, the applications may be somewhat limited. Similar to the criticism of Andrews et al.'s (1990) study, Lab and Whitehead (1990) would likely have similar remarks with respect to advocating for wilderness treatment approaches. First, wilderness treatment may be difficult to

implement. It is costly to begin a wilderness therapy program, requiring a great deal of training, and hiring talented staff members who would be willing to work in a wilderness situation with juvenile delinquents for approximately a month at a time. Considerations for finding a suitable location includes an environment where juvenile delinquents cannot run away, yet emergency situations could be handled promptly. Other challenges might include negotiating with insurance companies regarding risk, and so forth. Yet, while some might note that embarking on an endeavor such as this is costly, Deschneis and Greenwood (1998) reported that in the long run it is more cost effective than traditional means of rehabilitating juvenile delinquents and Roberts (1987) offered similar evidence.

A more serious concern, however, may be the ethical considerations of hiring staff with the appropriate credentials (Davis-Berman and Berman, 1994). Recent trends indicate support for "non-degreed staff, and generally support a non-professional model" (Davis-Berman and Berman, 1994). This raises concerns about the quality of care offered in wilderness treatment programs-how knowledgeable will the staff be, and what model of behavior modification will the program endorse given limited levels of education?

Another critique is that wilderness therapy may not be comprehensive. Perhaps components of traditional rehabilitation (i.e., time reduced for appropriate behavior, loss of freedoms for violent behavior) are more effective, but were simply not examined in this meta-analysis. Lack of rigorous research regarding effective components for juvenile offenders is not just limited to wilderness research programs. Roberts (1987) found that only 5 of 66 programs included in his study had completed

an evaluation of their programs, and these evaluations were based on the behavior of the juvenile delinquents for as little as six months after release from the program.

Yet another concern voiced in Lab and Whitehead's (1990) critique of Andrews et al. (1990) was the risk of excluding effective, empirically supported treatments such as cognitive behavioral therapy or anger management training. In some ways "wilderness" therapy is a catch-all phrase that does not allow guarantees that proven methods (such as cognitive-behavioral techniques) would be used (Davis-Berman and Berman, 1994). Berman-Davis and Berman (1994, p. 131) wrote,

"There is little doubt but that the out of doors and the wilderness environment is cleansing and encourages an openness that promotes change for many individuals. Viewing outdoor adventure programs in this way, the experience they offer may be therapeutic. But, we distinguish between that which is therapeutic and therapy. Thus, it is a mistake to assume simply that because a program is wilderness based, it is therapy."

Certainly this distinction between therapeutic and therapy would need to be examined further before any practical applications can be made.

In contrast to the suggestion that Andrew et al.'s (1990) recommendations were seen as not providing treatment to "low risk" offenders (Lab and Whitehead, 1990), just the opposite might be true with juvenile delinquents in a wilderness setting. Few programs may be willing to take the "high risk" offenders, or offenders who exhibit violent behavior, or are current substance abusers, and so forth. Wilderness therapy carries inherent risks, and many organizations control these risks by limiting who they allow to participate.

One final factor that has not yet been explored in terms of practical applications is one of diversity: gender and minority status. Most studies are based on Caucasian males in the juvenile justice system. How would conclusions based on these studies apply to females or members of minority groups? With respect to practical issues, would female juvenile delinquents be allowed to participate in a course that is primarily composed of male delinquents, or would females have their own courses? Would any facility have enough female juvenile delinquents to run a course, or would females simply be denied this type of treatment? There is not currently any research to show that wilderness therapy is more effective for males than females, in part because females compose such a small number of juvenile delinquents participating in these studies that meaningful statistics are not available. Further, previous studies in other areas have shown that the gender of the client does not impact the effectiveness of treatment (Zlotnick, Elkin, and Shea, 1998). Nevertheless, with respect to practical applications of wilderness therapy, even with no difference in gender and efficacy of treatment, more research will be needed to determine how to assure that females and other minorities are able to engage in wilderness therapy activities as frequently as Caucasian males would.

In sum, the practical applications of the finding that wilderness therapy is more effective than traditional means may be limited by the following: (a) wilderness treatment may be difficult to implement due to administrative concerns such as cost, finding and training qualified staff, and so forth, (b) wilderness therapy may not be comprehensive, (c) wilderness therapy may exclude existing treatments that are effective (e.g., cognitive behavioral therapy or anger management training), (d) few

programs may be willing to take the "high risk" offenders, or offenders who exhibit violent behavior, or are current substance abusers, and (e) there is limited information regarding effectiveness of programs for women and ethnic minorities.

#### *Limitations of the Current Meta-Analysis*

The conclusions from this study are limited by a number of factors. First, although the results of the meta-analysis indicate that wilderness therapy is more effective than traditional means, this meta-analysis is not capable of answering the question of why wilderness therapy is more effective. It is unclear if wilderness therapy meets other needs through smaller groups (i.e., the opportunity to receive individual attention), or if the immediacy of the consequences found in the wilderness (wet matches means no fire or cooked food) bring learning to a new level, a level that cannot be duplicated in a detention center.

Another limitation of the current meta-analysis is the small number of studies. A small sample size increases the risk of a Type I error, or seeming to find something that isn't there. Although searching for dissertations and other unpublished documents helps to safe-guard against the "file drawer problem," as well as the risk of a Type I error (by increasing the number of studies), it raises another interesting concern: the difficulty of finding studies. Of studies that met the criteria, only nine were published, and that was over the course of thirty-five years. Clearly, only a small number of studies are available to people who are examining this literature, some with the intentions of developing a meaningful program. Further, when many researchers are completing and publishing rigorous research, it seems

easier to accept the findings than it does when only a few studies have been published over three and a half decades.

As discussed above, the terms "wilderness therapy" and "wilderness treatment" are not well defined. Some "wilderness therapy" programs do not have a well-defined therapy component while others do. Some programs base interventions on empirically support treatments such as cognitive-behavioral therapy, while others use untested means. There is not currently a standard definition regarding what makes a program "wilderness therapy." This impacts the current study in that assessing the "therapeutic level" of the programs was not possible. Thus, conclusions cannot be drawn regarding a correlation between the intensity of the therapeutic component and the effectiveness of the program.

Few of the studies included in the current meta-analysis took into account variables such as age or gender of the participant, severity of the crimes, number of crimes, or length of criminal history. Because so few studies published these variables, meaningful analyses could not be completed. These variables would also help to define what makes wilderness therapy programs effective for juvenile delinquents.

Very few studies completed follow-up studies to determine how long the gains from wilderness therapy were maintained. It is evident that gains in the area of recidivism seem to dissipate over time. Although Baer, Jacobs, and Carr (1975) found that participants in a wilderness therapy environment were significantly less likely to recidivate over the course of five years, these results have not been duplicated. Indeed, Castellano and Soderstrom (1992) found that wilderness therapy

participants were less likely commit a crime in the following year, but that by the end of two years, the juvenile delinquents who participated in wilderness therapy had recidivism rates that matched the participants in the control group who had experienced traditional measures such as incarceration and probation. Even more disparaging to proponents of wilderness therapy, Weeks (1984) found that after only three months, juvenile delinquents who participated in wilderness therapy had recidivism rates similar to those who had experienced traditional approaches. Certainly wilderness therapy has other benefits, but two studies found that these benefits, such as improved relationships with family and friends, dissipate within four to six months (Pommier and Witt, 1995; Winterdyk and Roesch, 1982). Aside from the Baer, Jacobs, and Carr (1975) study, it appears that benefits of wilderness therapy disappear within months, and at most two years, after the completion of wilderness therapy. Unfortunately, other novel approaches to rehabilitation juvenile delinquents such as Boy's Town and Achievement Place also indicate that therapeutic gains are short lived (Kirigin, Braukmann, Atwater, and Wolf, 1982). To the credit of wilderness therapy, at least some gains have been documented. Other programs such as "boot camps" or the "Scared Straight" Programs, while intended to be helpful, have instead produced detrimental effects (Petrosino, Tupron-Petrosino, and Fickenauer, 2000; Sechrest, 1989).

Finally, none of the studies included in the meta-analysis provided after-care to the wilderness therapy participants. A study by Deschnes and Greenwood (1998) demonstrated that after-care helps participants make connections between the skills they learned in the wilderness, and applications of these skills in everyday life. Thus,

a final limitation of this study is that it could not address the question of what components of wilderness therapy help to maintain gains, and if one such component might be after-care.

#### *Recommendations for Future Research*

Given the above limitations, additional research on wilderness therapy for juvenile delinquents is needed. It is important that future research includes variables such as age, gender, severity of the crimes, number of crimes, length of history as a criminal, and length of the wilderness therapy program. Based on Deschnes and Greenwood's (1998) findings, it would be valuable to include and assess an after-care component. The after-care component might include a "booster" session, as has been found helpful for other therapy approaches (Eyberg, Edwards, Boggs, & Foote, 1998; Whisman, 1990). Finally, documenting the progress that the juvenile delinquent has made months and years after completing the wilderness therapy program would allow future researchers to determine how long the effects of the program might last, and design measures to prevent the effects from dissipating.

#### *Summary*

The results of this meta-analysis are clear in showing that wilderness therapy is in the short term more effective for juvenile delinquents than traditional measures such as incarceration and probation with respect to enhancing self-esteem/self-concept, increasing interpersonal skills and inducing behavior change, and reducing recidivism. Conclusions cannot be drawn as to why wilderness therapy is more effective than traditional measures, what long-term effects might be produced by wilderness therapy, or if wilderness therapy is more effective for particular groups of

individuals (i.e., groups based on severity of the crime, length of criminal history, gender, age, minority status, and so forth). Future research is needed to address questions such as these.

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Table 1  
 Calculated effect sizes for each study and conceptual category

Source	n	Interpersonal skills/ behavioral change	Self-esteem/ self-concept	Recidivism
Andrew (1971)	30			-0.5333
Baer, Jacobs, Carr (1975)	60			0.4103*
Bandoroff (1992)	66	0.8243	1.9143	
Birkenmayer (1975)	163		0.0777	0.2375
Boudette (1989)	69		0.6661	1.8696
Callahan (1989)	70		16.8353	
Castellano & Soderstrom (1992)	36			0.5471
Chiles, Jr. (1984)	90			0.4492
Collingwood (1972/1975)	19		0.2681*	
Gibson (1981)	89	0.4400*	0.5675*	
Gillis & Simpson (1991)	29	0.3561*	1.1003*	
Greenwood & Turner (1987)	266			0.2105
Hileman (1977)	39		0.3265*	0.0000
Kelly & Baer (1968)	60		-0.2595*	0.1354
Plouffe (1981)	154	0.4953	0.8706	0.3650
Pommier & Witt (1995)	79	0.5632*	1.2657	
Rice (1988)	223		0.4076*	
Thorvaldson & Matheson (1976)	197			0.1736
Weeks (1984)	36	-0.4613	1.0646*	0.0333
Wichman (1990)	72	0.9781		
Winterdyk (1978)	60		0.0826	0.6000
Wright (1982)	45		0.9366	
Zwart (1988)	90	0.2512	-0.0507	

Table 1 Continued

	Interpersonal skills/ behavioral change	Self-esteem/ self-concept	Recidivism
Number of studies (23 Total)	8	16	13
Number of studies with a control group	5	9	12
Calculated effect size for all studies	0.5023	0.5395	0.3136
Calculated effect size all studies, excluding Callahan (1989)	-	0.5122	-
Calculated effect size for studies with control groups	0.5226	1.5187	0.3088
Calculated effect size for studies with control groups excluding Callahan (1989)	-	1.6407	-
Fail-safe n for all studies	12.09	27.16	5.11
Fail-safe n for all studies, excluding Callahan (1989)	-	24.98	-
Fail-safe n for studies with control groups	8.06	59.34	4.89
Fail-safe n for all studies with control groups, excluding Callahan (1989)	-	64.83	-

\* based on pre-post data, no control group data available