The Effects of a Wilderness/Adventure Program on the Self-Concept, Locus of Control Orientation, and Interpersonal Behavior of Delinquent Adolescents

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THE EFFECTS OF A WILDERNESS/ADVENTURE PROGRAM ON THE
SELF-CONCEPT, LOCUS OF CONTROL ORIENTATION,
AND INTERPERSONAL BEHAVIOR OF
DELINQUENT ADOLESCENTS

by

Timothy J. Zwart

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Education
Department of Counselor Education
and Counseling Psychology

Western Michigan University
Kalamazoo, Michigan
April 1988
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The effects of a wilderness/adventure program on the self-concept, locus of control orientation, and interpersonal behavior of delinquent adolescents

Zwart, Timothy J., Ed.D.
Western Michigan University, 1988

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I am dedicating this dissertation to my wife, Alice, who has been by my side these past 5 years. Her prayers, support, and encouragement have enabled me to finish this project and to keep my sanity.

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Timothy J. Zwart
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CHAPTER I

INTRODUCTION

Since the 1940s, the field of outdoor wilderness/adventure education has become an increasingly popular self-growth experience. Outdoor wilderness/adventure is a term which has come to include collectively "any variety of outdoor activity (or activities), taking place in a wilderness environment, that is designed to improve the emotional and behavioral adjustment of the participants in that activity" (Gibson, 1979, p. 21). The use of the outdoors as a therapeutic milieu extends back to the early 1900s. In 1901, it was serendipitously discovered that hospitalized psychiatric patients who were housed in tents on the hospital grounds rather than indoors in order to relieve overcrowding showed improved physical and mental health. This led to increased interest in the therapeutic potential of camping and, as a result, camping programs have become a regular part in the programming of many psychiatric and rehabilitation facilities (Caplan, 1967). By the 1950s, summer camps became an increasingly popular form of treatment for disturbed children and adolescents (Gibson, 1979). In the 1960s, a number of wilderness/adventure programs directed toward the treatment of troubled adolescents were developed using the principles of Outward Bound, an experiential education program conceived and developed in 1941 by Hahn. Since this time, a considerable body of research has been conducted...
on the effectiveness of this type of wilderness/adventure program­
ing. Prior research has investigated the use of wilderness chal­lenge as a means toward self-enhancement/personal growth for the general population and, in many cases, as an alternative treatment modality for troubled youth or other special populations such as the handicapped or the terminally ill. Most programs of this nature have maintained that one of the primary outcomes of participation is an increased sense of self-esteem. As a result, many studies have attempted to show that participation in this type of program leads to a more positive self-concept as well as a number of other personality characteristics.

Limitations in Past Research

Unfortunately, the evaluations of adventure program outcomes have been limited in a number of ways. Shore (1977), in a review of 80 studies on the effects of Outward Bound, concluded that the findings were mixed, methodologically flawed, and confused. Winterdyk (1980) discussed several of the more critical methodological limitations of studies in this area. He cited several significant problems including: (a) the use of limited outcome measures, (b) the use of dependent measures having questionable validity, (c) reliance upon personal observation, (d) small sample sizes, and (e) poor design. With regard to the design flaws, random assignment to groups has often been impossible given the field-based nature of much of this research. As a result, most designs have been quasi-experimental in nature. It is incumbent upon researchers employing quasi-
experimental designs that they control as many threats to the internal validity of the conclusions as possible (Campbell & Stanley, 1963; Cook & Campbell, 1979). Unfortunately, many of the prior studies conducted in this area have failed to do this. As a result of his review, Winterdyk (1980) indicated that the results of prior studies on the effectiveness of wilderness/adventure programming:

would seem . . . to provide only tenuous results. Consequently, a universal acceptance of the findings should not be made. . . . [Yet] since the majority of reports still suggest that the outdoor wilderness experience can serve as a potential milieu for youth of various types, we should attempt to improve our evaluation designs and procedures before we make any rash decisions about the true status of the alternative. (pp. 70-71)

Winterdyk has suggested that there is a need for a design that provides greater control and, therefore, greater certainty regarding conclusions.

In addition to these more blatant methodological limitations, there have been other problems associated with research focused on such a diverse range of programs. Because of variations in programs, standardization and replication of findings are very difficult. Specific variables, such as the leadership style and skills of the instructor(s), the composition of a particular group, the specific task(s) in a given course, the degree of risk in these tasks, and the amount of stress that is induced, might potentially have an impact within a given program. Achieving experimental control of these extraneous program variables has been difficult given the field-based nature of most prior research (Kimball, 1980).
It has also been suggested that prior research has been open to the effects of experimenter or respondent bias. For example, many prior research studies have been conducted under the auspices of the Outward Bound organization. This has led some to question whether public promotion of the research might bias the respondent's answers or whether experimenter expectation might influence the interpretation of the results (Roberts, White, & Parker, 1974). Finally, the question could be raised whether course participants act as valid judges of how they have been influenced by such an experience. For example, if the participants enjoyed the experience, they might attribute all sorts of "good" effects to the experience; the converse is also true. As a result, this would still leave one wondering about the true effect(s) of such a program (Roberts et al., 1974).

Statement of the Problem

The need clearly exists for additional research on the effectiveness of wilderness/adventure experiences. The purpose of this study was to examine the effects of a 26-day therapeutic wilderness program for delinquent adolescent males on three conceptually distinct but closely related psychological constructs: self-concept, locus of control orientation, and interpersonal behavior. The literature review that follows demonstrates that these particular variables require further study.
Significance of the Study

This study was significant in several ways. First, this study provided a useful evaluation of whether the specific program under study met its stated goals and objectives. Second, this study added to the understanding of the specific psychological and behavioral changes that occur in the participants of this type of alternative treatment program. This information can be used to add to the theoretical understanding of the foundations for such change. Finally, this study had practical significance for the treatment of adolescents "at risk." The program under study in this research was an alternative treatment program for adjudicated adolescents. If it can be more conclusively demonstrated that a wilderness program is instrumental in producing positive changes in troubled youth then there might be far-reaching implications for the current juvenile justice system.

Limitations of the Study

This study was limited in a number of ways:

1. Given that this was field research and that administrative control was required in the selection of course participants, a true experiment with random assignment to groups was impossible. While the addition of a comparison group allowed many of the threats to internal and external validity to be controlled, the problem of selection biases remained a vexing problem. Therefore, as in any quasi-experimental design, interpretation of results was lowered from
a causal to an inferential level.

2. This design provided little control over the variables that typically vary among different programs (such as the types of activity, philosophical differences, instructional techniques, and the age of the participant). Further, this design provided little control over variables that varied from course to course within this same program. Since the data were collected from five different courses which were led by six different leaders, the differences in leadership style or philosophy were not controlled; and consequently, another possible source of error was introduced.

3. In the present study, the subjects in the comparison sample were also receiving treatment at the time of the testing. Hence, this study becomes a comparison of two forms of programming for delinquent adolescents. However, because the comparison subjects were at varying points within their treatment, a source of uncontrolled variation was introduced into the design.

4. In a study using participant self-report it is assumed that the subjects accurately and honestly report their responses to the inventories. While the author obtained reasonable cooperation from the participants of the wilderness program, this was not the case with the subjects in the traditional detention program, especially at the time of posttesting. There was some question about the honesty of these subjects' responses and this may have had an effect on the outcome. Behavioral observations by the course leaders were included to provide some external support for the experimental subjects' self-reports.
Research Questions

The purpose of this study was to examine the effects of a 26-day wilderness/adventure program on three psychological constructs: self-concept, locus of control orientation, and interpersonal behavior. The following questions were investigated in this study:

1. Will delinquent adolescents who participate in a 26-day wilderness/adventure program show more improvement in self-concept than adolescents in a traditional detention program?

2. Will delinquent adolescents who participate in a 26-day wilderness/adventure program exhibit a more internal locus of control orientation than adolescents in the traditional program?

3. Will delinquent adolescents who participate in a 26-day wilderness/adventure program report higher needs for inclusion and affection and a lower need for control than adolescents in the traditional program.

4. Will delinquent adolescents who participate in a 26-day wilderness/adventure program exhibit more functional interpersonal behaviors as a result of their participation?

Overview of the Study

In order to examine the research questions, three self-report inventories were administered to 43 adjudicated delinquent male adolescents participating in a 26-day wilderness/adventure program in northern Georgia. The wilderness program serves as an alternative to traditional detention treatment. The responses of those participating
in the 26-day program were compared to a sample of 45 male delinquent in a traditional detention program. These subjects completed the same inventories at the same 26-day time interval. In addition to the self-report data, behavioral observation data were gathered from the instructors of the wilderness courses to provide further observation of the behavioral/social effects of this program. Statistical analyses were directed to determine the differences between the experimental group and the comparison group on the variables measured by the three inventories (self-concept, locus of control orientation, and interpersonal orientation).

Justification for this study was derived from the limitations of past wilderness/adventure research which suggested that there is need for additional research on the effects of this type of alternative programming. The purpose of the present research was to examine the effects of a 26-day wilderness/adventure program on three variables shown by the review of the literature to be in need of additional study: self-concept, locus of control orientation, and interpersonal orientation. The significance and limitations of the current study were outlined as were the specific questions to be addressed. The following chapter contains a rather complete review of the large body of wilderness/adventure research. This review will provide (a) an overview of historical and theoretical foundations of the field, (b) the rationale behind the selection of the three variables chosen for further investigation in this study, and (c) a theoretical discussion of these variables. Described in Chapter III are the procedure and design of the study including a description of the sample, data.
collection methods, and statistical treatment. Chapter IV consists of the presentation of results. Chapter V consists of a discussion of these results including conclusions, limitations of the current study, summary, and recommendations for future research.
CHAPTER II

LITERATURE REVIEW

A vast amount of research on the effects of outdoor experiential adventure programs (both Outward Bound programs and those following the Outward Bound model) has accumulated over the past 20 years. As indicated previously, however, the validity of much of this research has been problematic due to limitations in sample sizes, measurement instruments, and research design (Shore, 1977; Winterdyk, 1980). The wilderness/adventure research relevant to this study relates to self-concept, locus of control orientation, and interpersonal orientation. A brief review of the historical and theoretical foundations of the Outward Bound movement is presented.

Historical Foundations

Outward Bound was begun by Hahn in 1941 in Wales. Hahn was a German Jew who had achieved international acclaim for his pioneering work in the field of education at the Salem and Gordonstoun schools in the early 1930s. His educational philosophy focused on developing a student's inner resources through both physical and mental challenge. The objectives of the Gordonstoun school included providing opportunities for children to: (a) discover themselves and to experience both success and defeat, (b) to forget themselves in the pursuit of a common cause, and (c) to develop their imaginations and
their ability to participate and plan (Winterdyk, 1980). Hahn was concerned that traditional education was too one-sided in its emphasis on intellectual development. He sought to stretch modern education so that it also addressed those aspects of the individual outside the cognitive domain—the affective, interpersonal, and spiritual. To do this, he developed an experientially-based model in which trained leaders led small groups of students through a series of intense, yet achievable tasks (Zook, 1986). In 1941, this model became the basis of Outward Bound. As originally designed, the Outward Bound program was intended as a survival training program for British seamen (Gibson, 1979). The popularity of this program grew in England and several schools were established, all founded on the same principles. In 1962, the Outward Bound institution was established in the United States. By 1979, 34 schools in 17 countries followed the principles of Outward Bound (Rice, 1979). In addition, there are hundreds of other outdoor wilderness/adventure programs in existence today that have been adapted from this philosophy. Many of these programs have been developed for use with troubled youth.

Theoretical Foundations

The increasing popularity and application of wilderness/adventure programs has been accompanied by an increased interest in the reasons that these programs seem to be effective, in other words, their theoretical foundations. A review of the principles underlying this type of program follows.
Kimball (1980) succinctly defined the basic tenets of the Outward Bound philosophy, when he wrote:

Outward Bound proponents believe personal growth results when an individual faces provocative problems inherent in such activities as mountaineering, rock climbing, cooperative group living, white water rafting, canyoneering, and caving. These challenges produce stress and anxiety which, in turn, demand initiative and group cooperation. Supporters of Outward Bound assume that by overcoming these problems, an individual surpasses self-imposed physical, emotional, and social limitations. (p. 1)

It is the stressful nature of the wilderness/adventure activities which set these programs apart from the therapeutic camping programs mentioned earlier. Stress is central to the change process in all wilderness/adventure programs. The actions demanded are designed to cause participants to "challenge their self-definitions and encourage them to explore and surpass what they thought were their limits" (Kimball, 1980, p. 11).

Wilderness/adventure programs are assumed to challenge the participant's self-system at a very basic level. To provide empirical support for this assumption, many researchers have attempted to measure the change in a participant's self-concept, that is, the phenomenological mental image that the individual carries around inside his or her head. Rogers (1951) offered a view of the self-concept that seems consistent with the challenge provided by wilderness/adventure programs. Rogers indicated that the self-concept "is composed of a series of tested hypotheses which provide much security ... a certain predictability upon which we depend" (p. 486). He maintained that while many of these hypotheses are confirmed by an individual's experiential reality, many remain untested. As he
indicated, "these untested perceptions are also a part of our personal reality, and may have as much authority as those which have been checked" (Rogers, 1951, p. 486). Wilderness/adventure programs provide a direct confrontation of these unchecked and untested perceptions. As Richard (1976) indicated, these programs:

> drive a wedge between self and perceived self, between reality and perceived reality . . . by bringing the person in rapid confrontation with a series of demands that give clear feedback to the participant. The circumstances are different from previous experience. He [or she] is stripped from contact with normal defense mechanisms, coping styles, routines, and relationships, and any other devices behind which he [or she] may previously [have] been able to shelter from reality. (p. 31)

The theory underlying wilderness/adventure programs, then, indicates that it is this stripping away of normal patterns and defenses and the resulting feedback from leaders and fellow participants that leads an individual to the testing of self-perceptions. As a result, it is believed that a closer congruence between the participant's real self-conception and ideal self-conception will occur. In Rogerian theory, this congruence has been associated with greater authenticity, genuineness, and psychological adjustment.

To this point, the importance of stress has been examined as one of the primary principles underlying wilderness/adventure programs. Kimball (1980) identified several additional principles that form the underlying conceptual framework of these types of programs. One common principle he identified is the emphasis these programs place on action. Kimball noted an interesting contrast between therapeutic adventure and traditional talk therapy. Whereas traditional talk therapy is primarily introspective and analytical, wilderness/
adventure programs "assume that experience is more therapeutic than analysis" (Kimball, 1980, p. 7). In talk therapy it is believed that attitude change precedes and leads to behavior change. In contrast, wilderness/adventure programs work on the assumption that attitude change follows behavior change. Thus, these programs are primarily action-oriented, pushing and challenging the participant to confront self-imposed "can'ts" through actual experiences. It is this emphasis on action that makes this type of program an appealing way to reach troubled adolescents—the majority of whom may not be introspective and analytical and for whom talk therapy is often ineffective.

A second common principle underlying wilderness/adventure programs is the use of the outdoors as a novel situation where, as has already been indicated, the individual is removed from the securities of the old environment. Again, the popularity of these types of programs with problem adolescents can be attributed in part to this principle. The novel situation into which the adolescent is impelled marks a major change from the authoritarian institutional rules to which the delinquent is accustomed. As Kimball (1980) noted, in the wilderness the rules are natural rather than arbitrary. The outdoor environment dictates that an individual respond flexibly and adaptively. The lessons of the environment emphasize responsibility rather than conformity: if one neglects to put up a tarp, one is miserable when it rains. (p. 8)

The wilderness teaches responsibility necessary for survival. This is a far cry from conformity to institutional rules and roles.
A third common principle underlying wilderness/adventure programs is the fact that they are, at the bottom line, group experiences. The challenges of survival demand a cooperative community. Kimball (1980) noted that it is the cohesiveness of the group that creates an atmosphere conducive to the honest sharing of feelings. Zook (1986) also noted that this type of program demonstrates the need for human interdependence, trust, and communication. As he stated, "In the wilderness, each participant's day-to-day existence depends largely on how well other individuals are upholding their responsibilities. Awareness of this fact ideally increases participants' sensitivity and concern for one another" (p. 56).

Finally, most wilderness/adventure programs operate on the principle of programmed unavoidable success. Troubled adolescents have often experienced a lifetime of failures. Wilderness/adventure programs are carefully designed so that this pattern of failure can be interrupted. In these programs success is built upon success. Kimball (1980) noted that many troubled youth will reject success because it is not congruent with their self-image. A benefit of the wilderness/adventure program is that success is "tangible and unavoidably recognizable" (p. 10). Thus, it becomes extremely difficult for participants to reject their successes. Consequently, they begin the process of altering self-perceptions.

To summarize, five common principles underlying wilderness/adventure programs have been presented: the central role that stress plays in the change process, the emphasis placed on action, the use of the outdoors as a novel situation, the development of a
cooperative community, and the principle of unavoidable success. These principles are embodied in the goals of most wilderness/adventure programs in existence today. In nearly every program an emphasis is placed on relationships, group identity, problem solving, physical challenge, and self-growth.

The purpose of the preceding section has been the provision of a brief overview of the principles and theoretical foundations underlying most wilderness/adventure programs. It should be clear to the reader that these programs are based on a complex and multidisciplinary interplay of factors. In the past there have been complaints that these programs are often developed, applied, and researched with no clear understanding of their theoretical bases. One of Winterdyk's (1980) criticisms was that few researchers have forwarded a theory that proposed to explain the relationship between wilderness experience and its expected results. Perhaps this is an accurate observation. The theory and principles underlying wilderness/adventure programs do cut across many fields: education; psychology; sociology; communications; recreation; and in some cases, religion. A complete theory would require a thorough working knowledge of all of these fields. Nevertheless, the principles outlined in this section seem to provide a starting point toward such a theory. The primary postulate of this theory being that wilderness/adventure programs challenge the participants to reexamine their self-definitions and their relationships with others and with nature. The mechanism by which this reexamination occurs is the confrontation
of physical challenge and the stripping away of familiar defense mechanisms and coping styles.

**Review of Studies**

Having examined the more important underlying principles and theoretical foundations of wilderness/adventure programs, the focus now shifts to the second major purpose of this inquiry, a critical review of the accumulating body of research on the psychological effects of participation in such programs. A vast amount of research on the effects of wilderness/adventure programs (both Outward Bound programs and those adapted from this model) has accumulated over the past 20 years. Many of these studies have questioned the effectiveness of wilderness/adventure programs in meeting their stated goals. By far, the majority of the studies conducted in this area have examined certain psychological constructs and have attempted to show that participation in a wilderness/adventure program leads to more positive psychological and/or social adjustment. In addition, many adventure programs have been designed for special populations (for example, juvenile delinquents, emotionally impaired adolescents, or the physically disadvantaged); and as a result, many studies have been conducted to determine the various effects of these more "treatment-oriented" programs.

**Wilderness/Adventure and Self-Concept**

Self-concept has been the single most researched construct in the wilderness/adventure literature. As previously indicated,
interest in this construct has seemed to stem directly from the theory underlying wilderness/adventure, i.e., that "growth" results from being stressed and stretched beyond self-determined limits. In the literature this "growth" often has been operationally defined as the change to a more positive self-concept.

Definition and Theoretical Considerations

Before reviewing the studies in this area it is necessary to have a clear understanding of the psychological construct called self-concept. It must be remembered that self-concept is only a hypothetical construct, that is, "an abstraction from specific behaviors—which is inferred or construed from observable events" (Wells & Marwell, 1976, p. 41). As a construct, however, self-concept has been the focus of a great deal of research, test development, and discussion. One of the major criticisms of self-concept research is the absence of a clear definition of the construct. As Marsh, Richards, and Barnes (1984) noted: "Self-concept, like many other psychological constructs, suffers in that 'everybody knows what it is' and researchers do not feel compelled to provide any theoretical definitions of what they are measuring" (p. 2). To this end, the present review will begin with an effort to provide some working definition of this construct and its measurement.

In an effort to define more precisely this construct several theoretical points of view will be presented each of which seems to play off one another rather consistently. Rosenberg (1965) defined self-concept as a set of reflexive attitudes, i.e., attitudes (facts,
opinions, and values) toward the self. He differentiated these reflexive attitudes into three key aspects: a cognitive aspect (the psychological content of the attitude), an affective aspect (a valuation attached to this content), and a conative aspect (the behavioral responses to the attitude object). In the literature, the terms self-concept and self-esteem are often equated. To be accurate, self-esteem is actually the second of the three aspects outlined above—the evaluative, judgmental, and affective aspect of an individual's self-conception (Rosenberg, 1965). Most of the research reported in the literature has focused on this affective aspect of the self-concept. Hence, in this inquiry, these two terms will be used interchangeably.

While Rosenberg (1965) has provided a fairly clear definition of self-concept, several other ideas can be added that will aid in understanding this construct. Rogers's (1951) view that the self-concept consists of tested and untested hypotheses was presented in an earlier section. What Rogers seemed to imply is that the self-conception is the central core of an individual's personality. This view is similar to one held by Lecky (1945). Lecky maintained that the organization of the personality is a dynamic interplay between the assimilation of new ideas and the rejection or modification of old ideas. He theorized that it is the self-concept, as the nucleus of the personality, that determines what is suitable for integration into the personality. Finally, Epstein (1973) indicated that the self-concept is really a self-theory, "a theory that the individual has unwittingly constructed about himself as an experiencing,
functioning individual . . . part of a broader theory which he holds with respect to his entire range of significant experience" (p. 407). Epstein's views are consistent with the view that the self and self-conception are the nucleus of the personality and the filter through which experiences are either assimilated into or rejected from the broader picture of the self. Epstein's theory that the self-concept orders one's perceptions into simpler categories which give meaning to one's experiences has been supported in a line of recent research (Marsh et al., 1984; Marsh, Smith, Barnes, & Butler, 1983; Shavelson & Bolus, 1982; Shavelson, Hubner, & Stanton, 1976).

This same line of research has also focused on the rather controversial question regarding the stability of self-concept. It has been argued that self-concept is a construct that remains stable over the life span (Marx & Winne, 1978; Winne, Marx, & Taylor, 1977). If this is the case, one might begin to wonder whether it is even reasonable to expect changes in self-concept following some systematic intervention (like a wilderness/adventure experience). If self-concept is a stable construct, then it would make little sense to base one's evaluation of any intervention (including a wilderness/adventure program) on self-esteem scores. Perhaps, however, as Marsh et al. (1983, 1984) have suggested, self-concept is a multi-dimensional construct. In one recent study it was noted that many of the changes in self-concept were specific to particular dimensions of self-concept (Marsh, et al., 1983). Similarly, Shavelson et al. (1976) suggested that an individual's self-concept is hierarchically structured from a specific self-concept to a more general self-
concept. These researchers indicated that as one extends downward from the general to the specific, the self-concept becomes less stable. The implication, then, is that in order to impact the more stable, higher-level general self-concept, changes in many situation specific instances inconsistent with this general self-concept will be required. As these situation-specific changes are assimilated into the broader self-concept, a change in the overall self-attitude might follow. This suggests that an intervention such as a wilderness/adventure experience might be effecting specific dimensions of a participant's self-concept while having very little effect on the more deeply established overall, or global, self-concept. This line of thinking also suggests that there might be a relationship between the level of change in global self-concept and the number of specific dimensions that a program impacts.

Finally, one of the recurring issues in any discussion of self-concept is the issue of the measurement of this construct. While self-concept is usually measured through self-report there has been some evidence that this may be an inaccurate way to measure this construct. One classic study, for example, demonstrated that there was no significant relationship between the inferred self-concepts of 59 sixth grade students and their self-reported self-concepts (Combs, Soper, & Courson, 1963). Nevertheless, short of behavioral observation and inference, self-report is the only viable measurement option at this time.

These issues are presented to highlight the fact that self-concept is a difficult construct to both define and measure. There
exist many theories and many more "self-concept tests." It behooves researchers undertaking the measurement of self-concept to begin from a consistent theoretical framework and to spell this out at the outset of the research. Additionally, it is of utmost importance that any researcher use empirically reliable and valid measurement instruments.

**Review of Studies With "Normal" Populations**

There have been many studies examining the effects of wilderness/adventure programs on the self-concept of normal individuals (i.e., nonpsychiatric, nonhandicapped, or nondelinquent). These will be briefly reviewed. One of the most comprehensive evaluation efforts to date of an Outward Bound program was a study of 620 adult subjects by Smith, Gabriel, Schott, and Padia (cited in Glass, 1976). These researchers developed a 47-item instrument designed to measure four variables: self-esteem, self-awareness, self-assertion, and acceptance of others. This study yielded inconclusive results, however, since only partial significant effects were found for the self-esteem, self-assertion, and acceptance of others variables. There was no significant effect at all for the self-awareness variable.

Using this same questionnaire, Boud (1977) found no treatment effect on any of the four variables. His study was confounded by the small number of subjects within the subgroups in this single intervention time-series design.

Clifford and Clifford (1967) studied 36 boys, ages 16-21, who participated in the Colorado Outward Bound School. They found
tendencies toward a greater degree of positive self-rating and self-description following the Outward Bound experience as well as a reduction of the discrepancy between the boys' real self-descriptions and their ideal self-descriptions. They concluded that Outward Bound was responsible for general rather than specific changes in the overall view of the self, and that these changes were related to the boys' initial levels of self-evaluation. Unfortunately, Clifford and Clifford did not include a comparison group in their study.

Smith (1972) studied 50 high school seniors and attempted to determine personality factors which changed as a result of an Outward Bound experience. She found that, compared to a matched control group, the experimental subjects showed a significant increase in daily school attendance and positive thoughts they had about themselves. However, teacher ratings of self-confidence, perseverance, and the ability to get along with others indicated no significant differences between the groups. In another study, Howard (cited in Barcus & Bergeson, 1972) used the Tennessee Self-Concept Scale (TSCS) to assess the effects of a 26-day survival training experience on the self-concepts of the participants. Posttesting indicated significant changes on 13 of the 19 TSCS subscales.

Wright (1982) compared situationally-specific and global self-concept measures in 57 male and female adolescents who participated in a 9-week high-adventure camping expedition. Using the TSCS, he found significant improvement in the posttest scores. Wright also administered the Gough Adjective Checklist (ACL) at several midpoints. The analysis indicated positive shifts in the self-concept
scales and a pattern of adjective use toward the areas of goal-direction and task-oriented behavior and attitudes. Wright concluded that specific views of the self influenced global views of the self. This finding supports the previously reported research by Shavelson et al. (1976) which concluded that the self-concept is hierarchically structured from global to specific.

Nye (1976) examined the changes in self-concept (as measured by the TSCS) of 82 participants in an Outward Bound program compared to a control group of 78 subjects. The results indicated that nine of the TSCS scales were significantly higher at the posttest. In a 3-month follow-up testing, these same scales were still significantly higher in contrast to the comparison group. Nye's study is significant since it included a control group and also studied the lasting effects of the experience. In a very similar study, Clinton (1972) administered the TSCS pre- and postexperience, and again 6 months following the experience to 291 boys who participated in a 26-day Outward Bound program. The results of this study showed a significant and positive change in 9 of 10 self-concept scales between pre- and posttesting. Three of these scales remained significantly positive at the 6-month follow-up. As in many studies, interpretation of these results was limited by the lack of a comparison group.

In another study of the effects of participation in Outward Bound on the self-concepts of "normal" individuals, Lemire (1975) found a positive change in the self-concepts of 22 high school students when compared to a comparison group. Kimball (cited in Winterdyk, 1980) used the TSCS to assess change in the self-concepts of 56
subjects. He found a significant change in total self-esteem and four other scales. Kimball did not include a comparison group.

Leiweke (1976) set out to determine whether the process of self-actualization was significantly influenced by an Outward Bound experience. He found that each of three scales from the Personal Orientation Inventory moved significantly toward self-actualization (movement towards inner direction, functioning more fully in the present, and a positive change in self-actualizing values). However, this study was limited by the absence of a comparison sample and a small sample size, among other factors.

The literature contains several reports in which the predicted effect was not observed. For example, a study of 10 adolescents participating in a 2-week outdoor challenge program in northern Michigan (Kaplan, 1976) showed no significant change in self-esteem. The author attributed this to a ceiling effect (the experimental group had a high level of self-esteem to begin with and thus had minimal room to change). Gillette (1971) found evidence that attitude change concerning personal values, social and political issues, and physical stress in 31 participants in a 21-day Outward Bound program tended to remain stable. Finally, Danziger (1982) used 2 fourth-grade classrooms as an experimental and a control group. The experimental group participated in adventure activities, group initiatives, and problem-solving activities. No significant change in self-concept was found for the experimental group. However, this group was found to use a broader range of interactive behavior.
One other study deserves note since it points out something often overlooked in the wilderness/adventure literature—psychological and/or social distress as a result of participation in a wilderness/adventure program. Robbins (1976) studied the effects of an outdoor survival program on the self-concept, personality, and re-adjustment to society following a 28-day Outward Bound experience. While Robbins did point out that significant differences were found on 10 measures of self-concept, he also noted that 35% of the participants were found to have two or more social/psychological problems following the experience. Further analysis indicated a reduced gain in self-concept scores, personality scores, and the lack of a value system for those 35% in "conflict." Robbins concluded that outdoor survival does not necessarily provide a positive experience for everyone. This seems to be an appropriate caution, especially to those who tend to view wilderness/adventure experiences as a panacea.

Review of Studies With Special Populations

Wilderness/adventure programs have enjoyed widespread application to special populations such as juvenile delinquents, emotionally disturbed adolescents and adults, and the physically impaired. Recently, wilderness/adventure programs have been used as an alternative treatment for juvenile delinquents in an effort to curb increasing recidivism rates. A number of researchers have tried to investigate the effects of this kind of intervention. In a frequently cited study, Kelly and Baer (1969) tested 60 male delinquents before and after an Outward Bound experience using the Jesness Inventory (JI)
(an adolescent personality inventory yielding 10 trait scores) and 10
self-concept measures (using a semantic differential). In addition,
a comparison group of 60 delinquents was also tested at the same time
interval. Significant changes were found on 6 JI scales (shifts
toward social adjustment and more uncritical self-acceptance, and
shifts away from lower-class values, egocentric thought, distrust,
and the feelings of anger/hostility) as a result of the Outward Bound
experience. Analysis of the semantic differential indicated that the
boys reevaluated themselves, increased their level of aspiration/
maturity, and gained a more favorable view of nondelinquents. A
similar study by Hileman (1979) lent additional support to these
findings. In addition to the changes noted by Kelly and Baer (1969),
Hileman found that the delinquents had a significant decrease in
feelings of alienation. In a study reporting follow-up data on their
120 subjects, Kelly and Baer (1971) reported that only 20% of the
experimental group had recidivated, whereas 42% of the comparison
group had recidivated.

In another study on the self-concepts of male juvenile offend­
ers, Svobodny (1979) compared self-concept scores for a group of
offenders placed in an Outward Bound program with those placed in
traditional community probation. She found that there was a signifi­
cant positive change in the self-concept scores of offenders placed
in the Outward Bound program while no such change occurred in the
scores of those assigned to the traditional probation program.
Svobodny appropriately warned that no firm conclusions could be drawn
from these results because of the nonequivalence of the two groups.
Nevertheless, her results suggest the positive effect of wilderness/adventure programs on the self-concepts of juvenile offenders.

Winterdyk (1980) conducted a similar study comparing wilderness/adventure to more traditional forms of juvenile treatment. In this study, 60 male probationers were randomly assigned to either an experimental group (wilderness/adventure program) or a control group (standard probation). Winterdyk found no significant relationship between the treatment and self-reported measures of self-concept or personality characteristics. However, descriptive reports from the participants and evaluative comments from staff and parents did support the program's short-term impact. This study is noteworthy in that it is one of the few studies employing a true experimental design.

A study by Cytrynbaum and Ken (cited in Gibson, 1979) on the effects of survival training on the self-concepts, behaviors, and social functioning of 49 male and female delinquents, ages 14-29, yielded significant positive changes in self-concept and behavior as compared to a 54-subject nonmatched comparison group. At a 6-month follow-up, the experimental subjects exhibited significantly better social functioning than the comparison group.

Wilderness/adventure programs have also been used in the treatment of emotionally disturbed adolescents (not necessarily "delinquent") and adults. However, the research literature is more sparse in this area and contains a number of methodologically weak studies, many of which are anecdotal in nature. In a well-designed study, Porter (1975), using a self-concept scale and a behavior rating
instrument, observed positive changes for problem and emotionally
deprived youths. Adams (cited in Gibson, 1979) studied the effect of
survival training on the self-concepts and personality characteristics of 19 male and female emotionally disturbed adolescents (psychiatric inpatients). He reported an increase in several of the self-concept scales and a decrease in the number of signs of personality deviancy. Unfortunately, this study was weakened by the small sample size and lack of a comparison group.

In a more anecdotal report, Collingwood (1972) documented the effects of a 3-week survival program on 19 adolescent rehabilitation clients. He reported significant gains in physical fitness, body-image, self-concept, and self-acceptance. As follow-up evidence for the success of this program, Collingwood reported that 8 boys were in vocational training (versus 3 prior to the program), 7 were in school (versus 1 prior to the program), and 2 were on jobs (versus none prior to the program).

In addition to the above, there are numerous studies (primarily with emotionally disturbed adolescent and adult psychiatric patients) reported in the literature that either failed to report the measurement instrumentation used or used questionnaires or other measurement instruments of questionable validity (Barker & Weisman, 1966; Hobbs, 1966; Kistler, Bryant, & Tucker, 1977; Loughmiller, 1965; McCreary-Juhasz & Jensen, 1968; Polenz & Rubitz, 1977; Rawson, 1973; Rickard & Dinhoff, 1967, 1971; Ryan & Johnson, 1972; Tuttle, Terry, & Shinedling, 1975; Weisman, Mann, & Barker, 1966). The programs associated with these studies ranged from wilderness survival
experiences to simple outdoor camping. In addition, the dependent measures studied also varied from the observed increase in social interaction to such a poorly defined measure as "success rate."

Wilderness/adventure programs have also been applied in special education settings. For example, Richards and Richards (1981) studied the effects of a 6-week Outward Bound program on 12 underachieving boys from an inner-city Australian school. They found that this program led to an increase in reading and mathematics achievement scores, significant personality changes, and a significant increase in self-esteem. They also found that these children were more hopeful about the future, more positive and confident about their schoolwork and the learning process, and were more cooperative.

Outdoor adventure programs have also been applied to the educable mentally retarded/slow learning population. A true experiment by Vidolovits-Moore (1979) showed that the self-concepts of subjects from this population improved as a result of a residential outdoor adventure program. Berube (1975) also reported positive changes in the self-esteem and social interactions of 10 mentally retarded children following a survival camping experience.

Conclusions

The results of a number of studies showing the effect that participation in a wilderness/adventure program has on the self-concept of individuals from a variety of populations ("normal" adults and adolescents, juvenile delinquents, emotionally disturbed adults and adolescents, underachieving adolescents, and mentally retarded
children) have been presented. While the results of many of these studies do suggest that outdoor wilderness/adventure programs have a positive effect on the self-concept of the participant, it should be remembered that many of these studies suffer from one or more difficulties—small sample sizes, the lack of comparison groups, and the lack of follow-up measurement, to name just a few. These difficulties seriously limit causal interpretation and the external validity of findings. There is indeed room for improvement in the design and methodology of future studies. Minimally, given the field-based nature of this type of research, additional replication of the results obtained through quasi-experimental methodology would strengthen both interpretation and generalization.

Wilderness/Adventure and Locus of Control Orientation

The Locus of Control Construct

Change in locus of control (LOC) orientation is another effect which might be logically expected as a result of participation in a wilderness/adventure program. The dichotomy of internal-external locus of control describes the manner in which an individual evaluates the events that occur in life and the meaning ascribed to those events. An individual with an internal (I) orientation views environmental events "as being a consequence of one's own actions and thereby potentially under personal control" (Lefcourt, 1976, p. 29). An individual with an external (E) orientation perceives events "as being unrelated to one's own behavior and thereby beyond personal"
control" (Lefcourt, 1976, p. 29). Whereas persons with an internal LOC believe that both positive and negative outcomes are related to hard work or skill (or the lack of), persons with an external LOC believe that such events occur as a result of luck, chance, or fate.

Research findings support the notion that an internal LOC orientation is the more "psychologically healthy" of the two. Research has shown that those with an external orientation tend to be more anxious, aggressive, dogmatic, less trustful of others, and lacking in self-confidence (Joe, 1971). Individuals with an internal orientation tend to be more concerned with achievement-related activities and in achieving a measure of control over the personal environment (Joe, 1971). Persons with an internal LOC orientation depict themselves as active, striving, achieving, powerful, independent, and effective (Warehime & Foulds, 1971). Having said this, it must be pointed out that it would be very simplistic to see internals as the "good guys" and externals as the "bad guys." Strickland (1979) warned: "While much of the I-E research does suggest that internality is related to adaptive and competence-type behaviors, one must be more than cautious in suggesting, conversely, externals are universally maladaptive and incompetent" (p. 264).

Locus of control has been widely misrepresented in the literature to be a trait, that is, some enduring characteristic within an individual. Lefcourt (1976) reminded that LOC is a construct—a working tool in a social learning theory—not a trait. Nevertheless, it does appear that LOC beliefs tend to shift toward internality as children mature (Strickland, 1979). Yet, for adults, the stability
of I-E beliefs is more difficult to assess. Strickland has noted in this regard that:

Change or stability of beliefs during adulthood have been more difficult to assess but I-E beliefs do appear to be flexible in response to specific events in one's life. In times of great adversity, when an individual perceives oneself as powerless and unable to influence events, one's beliefs may become more external. When things appear to be going well and this positive state of events is perceived as contingent on one's own effort, internality increases. (p. 259)

Appropriate caution must be taken not to misinterpret or oversimplify this construct, especially as it relates to individual changes as a result of specific treatment interventions.

The Relationship Between Wilderness/Adventure Programs and Locus of Control Orientation

Based on the preceding discussion, one might expect that following a wilderness/adventure experience, individuals might begin to see themselves as more in control of their environment. Coming face to face with one's fear and then successfully overcoming that fear through personal and corporate activity should theoretically reinforce the more internal belief that events are under personal control. This should be especially true of those individuals who tend to feel vulnerable and powerless in the face of life's events, for example, those of lower socioeconomic standing, children removed from abusive homes, delinquents enmeshed in a dysfunctional family system, chronic psychiatric patients, etc. It might be expected that these individuals would typically express a more external orientation.
Review of Studies

A number of investigators have measured the effects of outdoor wilderness/adventure programs on the locus of control orientation of the participants (and have often included measures of self-concept as well). Gaston, Plouffe, and Chinsky (cited in Gibson, 1979) reported a significant positive change in locus of control, self-confidence, self-image, and problem-solving ability in their sample of 103 male and female adolescent delinquents participating in a 19-day wilderness survival training experience. At a 6-month follow-up, the experimental subjects maintained a significantly greater internal locus of control orientation and exhibited less deviant behavior than the nonmatched control group. The conclusion was drawn that both personal control and self-confidence were positively affected by the program.

Marsh et al. (1984) studied the multidimensionality of self-concept and the effects of participation in an Outward Bound program. The results showed a statistically significant positive shift in self-description and self-concept as well as a shift to a more internal LOC orientation. This was a carefully conceived and well-analyzed study. The investigators were able to rule out many of the common threats to the validity of their conclusions. Consequently, this investigation appears to be one of the most valid to date.

In another study, Wright (1983) evaluated the effects of an adapted Outward Bound program on the self-esteem, self-efficacy, LOC beliefs, problem-solving ability, and physical fitness of juvenile
delinquents. He found a significant difference between the experimental group and the control group (juveniles awaiting placement in the program) in self-esteem, self-efficacy, internality, and fitness. He failed to find a significant increase in problem-solving skills.

Luckner (1985) studied the effect of a 10-day winter outdoor adventure education program for the hearing impaired on self-concept and LOC. Ten students were tested before and after the program, and again 2 months following the program. A matched control group was studied at the same intervals. Results indicated that there was a significant positive effect on both self-esteem and internal LOC for the experimental group. This was maintained at the time of follow-up.

The effects of a nonstressful structured camp experience on the LOC and self-concept of children with chronic health problems or sensory/perceptual impairment was investigated by Shosby, Heuchbert, and Gansneder (1984). They reported that in their sample of 170 subjects, aged 7-16, overall self-concept increased positively and LOC orientation became significantly more internal as a result of the camp experience. No comparison group was utilized, however.

Gaar (1981) included a measure of locus of control in her study of a 28-day wilderness/adventure program. Details of her study will be provided in a later section. For now, it should be noted that she found a significant relationship between external LOC and interpersonal trust, namely, that external LOC was associated with higher interpersonal trust. This finding contradicted both her hypothesis and the significant relationship between externality and low trust.
previously reported by Rotter (1975). Gaar interpreted her finding to be an example of "adaptive externality," or external LOC that is adaptive and beneficial to the group. Gaar noted that decision making in the wilderness was made in one of two ways: (a) the group as a whole provided input and reached consensus, or (b) the decision-making responsibility would be given over to the group leaders. In the first case, the consequences of any decision would be felt by the group as a whole. Therefore, no one individual would feel that he had control over the reinforcement received after that decision. In the second case, the group members had no control over subsequent reinforcement. In either case, however, the placement of trust in other group members would be required and a strong interdependency would develop. In this situation, then, external LOC becomes very adaptive.

Two other studies investigated only LOC as a primary variable. Eastman (1973) studied groups of 10 boys (aged 11-15) assigned to one of four treatment groups. One group received 2 weeks of classroom survival training followed by a 2-week, 24-hour-a-day wilderness experience. A second group received the same classroom training followed by 2 weeks of daily outdoor experiences. The third group received only the classroom training, while the fourth group received no training and served as the control. Eastman found that there was no significant change in locus of control orientation as measured by a LOC scale. However, an analysis of the daily logs of those scoring in the most internal direction revealed six critical requirements for internal orientation.
Finally, in a study closely related to wilderness/adventure, Nowicki and Barnes (1973) reported that a 1-week (nonstressful) camping program for 261 inner-city teens led to a change toward an internal LOC orientation and that this trend continued in 27 subjects who returned for an additional week.

Conclusions

In summary, these studies tend to support the relationship between wilderness/adventure programs and their effect on the locus of control orientation and self-esteem of their participants. Following participation in this type of experience, individuals reported a more internal LOC orientation and a more positive self-concept. However, this relationship seems only suggestive at this point. Further research into the effect of wilderness/adventure programs on locus of control orientation seems warranted.

Wilderness/Adventure and Interpersonal Orientation

Improved interpersonal functioning has usually been a major goal of most outdoor wilderness/adventure programs. The objectives of most programs indicate that participants will gain an appreciation of their interdependence with others in the group and that as a result communication will be promoted. A major aim of many programs, especially those with delinquents or emotionally disadvantaged individuals, is simply to teach basic trust in others. It is surprising, then, to find that only a few studies have examined this as an effect of adventure programming. Interpersonal change seems to be one of
those effects that has been implicitly accepted but not validated through empirical study. A review of the few studies that have investigated this effect follows.

Review of Studies

As previously cited, Gaar (1981) studied a 28-day wilderness/adventure program. The aim of her study was to test Rotter's (1975) expectancy hypothesis—the theory that generalized expectancies (GEs), that is, expectations about reinforcement generalized from previous experience, exert greater influence as a situation is more novel and ambiguous. Rotter hypothesized that specific expectancies (SEs) come to replace GEs in the determination of behavior as more experience in a given situation is obtained. The wilderness setting was believed to be an ideal testing ground for this theory since the wilderness was an entirely novel situation for these largely urban participants. Of interest to the current review are the specific GEs chosen for study: interpersonal trust, locus of control, and interpersonal style. Correlation of these with a measure of interpersonal distance was taken as the behavioral indication of influence of these GEs. Gaar failed to find the predicted relationship between GEs and behavior at the beginning of the course (i.e., the GEs did not appear to be exerting a significant influence at the beginning of the course). She did note, however, that interpersonal trust appeared to be the most salient factor (interpersonal trust was the only measure to change significantly between pre- and posttesting). At the end of the course some maladaptive interpersonal behavior was still evident.
However, a reversal was noted in the 3-month follow-up testing. Gaar proposed that adaptive specific expectancies (SEs) learned during the course took time to be assimilated into the GE repertoire of the juveniles (i.e., the juveniles were eventually able to apply the positive experiences from the program to more general aspects of their interpersonal interactions). Since the primary purpose of this study was the testing of a specific theory, the interpretation and applicability of these results to outcome research is more difficult. A more direct study of these variables as they are influenced by this type of wilderness intervention appears warranted and would lend further understanding.

Several studies have focused on a more direct investigation of the interpersonal effects of this type of program. Stimpson and Peterson (1970) investigated the effect of a 3-week survival training experience on eight male underachieving high school students. These students had experienced school failures, conflicts in family relationships, inadequate peer relationships, and feelings of alienation. Data were collected before and after the experience using the Fundamental Interpersonal Relations Orientation-B (FIRO-B) (a measure of the interpersonal needs for inclusion, control, and affection), and the Self and Others Rating Scale (SORS). Results indicated no significant differences on the FIRO-B but a significant increase in the students' evaluations of themselves and their parents on the SORS. The authors appropriately urged caution in generalizing from such a small sample, especially with the absence of a comparison group.
In an evaluation of the Connecticut Wilderness School, Stewart (1981) administered the Jesness Inventory (JI) to 24 troubled adolescents before and after an Outward-Bound-type wilderness experience. The results showed a significant positive shift in the JI subscales related to interpersonal functioning. The author also noted that this shift was maintained at a follow-up testing 6 months later.

Hobbs and Shelton (1972) concluded (based on staff report and participant observation) that there were favorable changes in the interpersonal skills, cooperation, and functional skills of emotionally disturbed adolescents as a result of an Outward Bound program. Sniderman (1974), using a sample of 26 male children, aged 5-11, and a matched control group, found significant improvement in the social adjustment of the experimental subjects. Beker (1960) reported positive change in the social and emotional growth of 261 sixth-grade students as a result of a school camping experience. This was maintained at 4 months when compared to a control group.

Finally, Alton (1982) concluded that an experiential outdoor education program with specific intervention activities (including a 2-week wilderness canoeing experience) resulted in the affective development of 13 gifted boys. Affective development was defined in this study to include three aspects—self-confidence, interpersonal confidence, and group skills.

Conclusions

It seems clear that these studies provide only preliminary data on the relationship between wilderness/adventure programs and change.
in interpersonal orientation and behaviors. The review of the current literature reveals this relationship to be a neglected area of study. Furthermore, the studies that have focused on the interpersonal effects of such programming have used inadequate samples, designs, and measurement instruments. It seems, then, that this relationship merits further investigation.

Conclusions Based on the Review of the Literature

An effort has been made to present the results of many of the studies reported in the wilderness/adventure literature. A summary of the shortcomings of previous studies and areas for further inquiry follows.

As indicated, self-concept is the psychological construct that has received the most attention in the wilderness/adventure literature. The results of the majority of these studies seem to suggest that wilderness/adventure programs do indeed have a positive effect on the self-concept of the participant. However, limited data is available on the length of time this effect is maintained. In addition, many of the studies suffer from small and nonrepresentative samples and the lack of comparison groups. Another often overlooked problem is the use of dependent measurement instruments of questionable reliability and validity. An area suggested for further study is the application, and subsequent effects, of wilderness/adventure programs on the self-concept of emotionally impaired, nondelinquent adolescents as a form of treatment.
Studies of the locus of control construct also seem to suggest that participation in a wilderness/adventure program leads the individual to a more internal LOC orientation. That is, following participation in such an experience, an individual reports feeling more in control of the environment and its events. The need exists, however, for additional well-designed studies and for further research on different populations.

Despite the fact that improved interpersonal functioning is frequently an aim of wilderness/adventure programs, there has been little empirical investigation of this change as a result of participation. The results of those studies reported in the literature review were mixed and allow no firm, conclusive evidence. Additional study of the relationship between interpersonal change and participation in a wilderness/adventure program seems warranted.

Research on the effects of participation in wilderness/adventure programming is difficult, to say the least. The results of such research as reported in this inquiry seem to provide tenuous but suggestive conclusions. This review indicates the need for improved research design. However, given the field nature of this research, randomization to experimental conditions is usually not possible. Consequently, further empirical study becomes even more important. As the positive results from further quasi-experimental studies continue to accrue, more confidence can be placed in the conclusion that participation in a wilderness/adventure program can lead to personal growth. Until greater certainty can be placed in this conclusion and until more is known about the specific kinds of changes that do occur...
and what causes these changes, wilderness/adventure programs merit continuing experimental scrutiny.
CHAPTER III

DESIGN AND METHODOLOGY

Description and Selection of the Experimental Sample

Forty-three male juvenile offenders participating in the Wolfcreek Wilderness Youth Development Program were tested during five separate group experiences during spring-early summer, 1987. Group 1 originally consisted of 9 youths. Of these, 6 successfully completed the course (one dropped out, one was removed from the course, and one completed the course but was not allowed to graduate). Group 2 consisted of 11 youths, all of whom completed the course. Group 3 originally consisted of 10 boys, 1 of whom was removed from the course. Group 4 originally consisted of 10 boys, 2 of whom did not complete the course. Finally, Group 5 originally consisted of 10 boys, all of whom completed the course. However, the test results of one of these subjects were not able to be included in the study. The subjects ranged in age from 14 to 17 and each group was racially balanced. Each group was led by two instructors. The same pair of instructors led Groups 1, 3, and 5. Two different pairs of instructors led Group 2 and Group 4.

The participants in the wilderness youth development program came from a wide variety of socioeconomic and family backgrounds. These ranged from backgrounds of severe poverty and instability (and often accompanied by exposure to violent and illegal acts) to youths
from apparently "stable" middle-class family backgrounds. All of the youths were under the supervision of state court service workers as a result of juvenile offenses. These offenses ranged from breaking and entering to drug dealing to sexual acting out.

The selection of participants for a particular course began several days prior to the beginning of the course and took place at a regional youth development center in northern Georgia. All participants were referred to this program by their court service workers and had to meet several conditions prior to being interviewed. For example, the potential participant had to be at least 13 years of age, have no physical handicaps, could not be taking psychotropic medication, and must have had a complete psychological and medical evaluation. During the screening session, 12 to 20 youths were individually interviewed by a representative from the division of youth services, the Wolfcreek course coordinator, the Wolfcreek instructors leading that particular course, and the youth's court service worker. During this interview the youth received a complete explanation of the Wolfcreek program including a realistic description of the various activities and the challenges of the course. Individual and group responsibilities were explained during the interview as were the basic course rules (no running from the course; no fighting; no drugs, alcohol, or tobacco; participation required in all activities; and the maintenance of a good attitude). During the interview, assessment was made regarding the attitude of each individual. Desirable characteristics included a genuine desire to change and improve oneself, a lack of self-confidence, a lack of
violent crime history or tendencies, one who admitted having a problem, and the presence of a supportive environment to which the youth could return upon completion of the course. Final selection was made based upon the subjective feelings of the staff that the youth would benefit from the program based upon his attitude as shown in the interview. Other group considerations also entered into the final selection. For example, some effort was made to balance the group according to physical size (i.e., a blend of larger and smaller youths), assertiveness (i.e., a blend of both assertive and more withdrawn youths), and race. After a youth was selected he signed a contract in which he agreed to complete the course, to care for the physical and emotional support of group members on a continuing basis, to cooperate with group members and instructors, to complete all activities, and to work on the personal goals which had been identified during the interview.

Description and Selection of the Comparison Sample

Since the Wolfcreek Wilderness Youth Development Program serves as an alternative to the more traditional detention programs and since the goal of the present study was to examine the effects of this type of alternative treatment, it was determined that youths in a more traditional program would serve as a comparison sample. A sample of 47 male juvenile offenders detained at the Youth Development Center (YDC) in Atlanta, Georgia, were tested and provided comparison data for this study. The population of the Atlanta YDC was composed of youths with similar backgrounds as those who
participated in the wilderness youth development program. These youths have been confined to the YDC following second offenses and/or violations of probation. The program at the YDC provided traditional forms of juvenile treatment including a success-oriented school program, recreation therapy, group experiences with social workers, alcohol and drug education, and limited individual or group psychotherapy with a Ph.D. psychologist. The YDC used a behavior modification program of levels and corresponding privileges. The average length of stay for these youths was 7-12 months and following this detention the youths either returned home or were placed in foster care or in another specialized facility for additional treatment. The subjects composing this comparison group were randomly pulled from a master list of the total Atlanta YDC population. The subjects were tested in three groups of approximately 15 youths. The sample originally contained 50 youths but was reduced to 47 as a result of discharges between testings.

Description of the Wilderness Youth Development Program

The following description of the Wolfcreek Wilderness Youth Development (WYD) Program highlights the goals and philosophy of this program:

This 26-day, totally mobile, wilderness program was developed for the Division of Youth Services by Wolfcreek Wilderness School, a private, tax-exempt organization located in the mountains near Blairsville, Georgia. The basic philosophy of the Wolfcreek School stresses the concept that students will not only gain more knowledge but be better able to transfer this knowledge to future life situations when learning is accomplished through actual hands-on experience.
A wilderness environment, one that an inner-city youth is totally unfamiliar with, and the new skills required to cope with it, offer a fresh chance to develop self-confidence and the ability to manipulate the environment by living successfully with it.

Within a Wolfcreek Wilderness program, activities are planned that provide personal growth experiences. Success is built upon previous success. The small group is the prime social unit, 10 members living together, acting as a team, needing to develop cooperative efforts and group decision-making abilities in order to succeed. Evening discussions and group sessions underline the purpose of the activities, emphasize the values and bring conflicts to the surface. The activities are not an end in themselves, but merely the vehicle through which personal growth can take place. They provide opportunities for value-forming experiences.

The obvious need for skills—such as tent building, camp cooking, direction finding, climbing techniques and first aid—permits learning to take place in a non-authoritarian setting. Feedback is immediate in terms of the result—food is burned when it is improperly cooked; a sleeping bag gets wet if a tent is inadequately pitched. Problem-solving techniques are learned through day-to-day living tasks. An individual shares in the success that is only possible through cooperation, persistence, and teamwork. The experiences provide opportunities to be successful, to help, and to be helped. Sharing is essential and communication is improved.

Stress situations compel a student to face his own reactions, his abilities and inabilities, and to make decisions for himself. Rock climbing and rappelling are emotional high-risk situations of immediate confrontation. Frustration will not help one get up a rock face, and it is quite often impossible to back down. Persistence is rewarded by finally achieving the summit. The accomplishments are personal successes; the reward is from within.

The youth selected are expected to benefit by experiencing improvement in the following areas:

(a) Self-concept—self-esteem, self-worth

(b) Personal growth—curiosity, motivation

(c) Social responsibility—self-control, responsibility to rules and authority, consideration of others
(d) Group interaction—communication, trust, consideration of others

(e) Problem solving—ability to solve and resolve the challenges of living together in the wilderness.

Self-concept is enhanced by the course content and instructor interaction. Debriefing and circles [process time] serve to enhance the growth achieved during these activities. Personal growth is promoted through exposure to new environments and successful completion of the activities (including the solo expedition). Social responsibility is promoted by defined and enforced limits, contracts and personal goals, confrontations from instructors and crew, and a service project. Group interaction is promoted by day to day involvement in camp, meal preparation and cleanup, and circles. Problem solving is promoted through contracts, circles and other group processing, orienteering/map and compass, and the final solo expedition. (Wolfcreek Wilderness School Policy Manual, undated, not paginated)

Each wilderness course was centered on the core experience of backpacking/hiking. Each day a new campsite was set up and then broken down the next morning. In addition to hiking/camping, several other activities were also included, each of which incorporated a certain amount of stress. The degree of stress associated with a particular activity was individually experienced depending upon one's physical capabilities, prior experiences, and/or personal fears. Each activity posed a unique set of challenges requiring new skills. Rock-climbing and caving usually involved the conquering of personal fears, while whitewater canoeing added the element of communicating with a partner. Group initiatives (trust games) requiring group interdependence were often psychologically taxing. Backpacking was often the least stressful of the activities. Nevertheless, it often provided the most meaningful learning experiences because it forced students to deal with day-to-day group issues such as making or
breaking camp in time, meal preparation and cleanup, and any of the other group decisions made in the course of a day. Living together as a group 24 hours a day for 26 days provided many opportunities for modeling, teaching, and practicing conflict resolution; socialization; and communication skills.

Toward the end of the course a 3-day solo expedition was scheduled. This experience gave each student a time to reflect back on the course—the skills that had been learned and the personal insights that occurred. Each solo site was out of visual sight of any other student and the instructors. Instructors made visual checks at least six times a day (two of which included verbal communication). Each student was provided a supply of nutritious food that did not require cooking and was also instructed to stay within 100 yards of the tarp site at all times.

At the end of the course a graduation exercise was held to which the youth's court worker and family members were invited. Opportunity was provided for the youth to share his experiences with his court worker and family members. This ceremony provided a way to highlight and reinforce the youth's accomplishments.

Operational Definition of Terms

The purpose of this study was the examination of the effects of a 26-day wilderness/adventure experience on the self-concept, locus of control orientation, and interpersonal orientation of delinquent adolescents. The following operational definitions were offered:
Wilderness/Adventure Experience

In this study, this experience was defined as the Wilderness Youth Development Program of the Wolfcreek Wilderness School. This program, as described in the preceding section, was a short-term, 26-day, treatment program for youth committed to the Department of Human Resources, Division of Youth Services, as an alternative to placement in a state institution for delinquent and unruly youth. Youths participated in a variety of activities such as backpacking, camping, rock climbing, caving, and/or whitewater canoeing.

Self-Concept

Subjects were said to possess a positive self-concept if they endorsed statements on the Piers-Harris Children's Self-Concept Scale (PHCSC) (Piers & Harris, 1969), which indicated that they valued and accepted themselves in a number of broad areas. These areas included: (a) behavior—the extent to which an individual admitted or denied his problematic behaviors; (b) intellectual and school status—an individual's assessment of abilities with respect to his or her intellectual and academic tasks (including satisfaction with school and future expectations); (c) physical appearance and attributes—an individual's attitudes concerning his physical characteristics; (d) anxiety—a reflection of general emotional disturbance and dysphoric mood; (e) popularity—an individual's evaluation of his popularity with classmates and ability to make friends; and
(e) happiness and satisfaction—a measure of an individual's general satisfaction with life.

Locus of Control Orientation

An individual was said to possess an internal locus of control (LOC) orientation if he or she endorsed items on the Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973) indicating that he or she believed environmental events were a consequence of his or her own action and therefore potentially under personal control. Conversely, an individual was said to possess an external LOC orientation if he or she endorsed items on this scale which indicated that he or she saw no connection between environmental events and personal behavior and believed that such events occur as a result of luck, fate, or chance.

Interpersonal Orientation

Interpersonal orientation was defined as a subject's self-reported characteristic interpersonal behavior toward others in three primary areas measured by the Fundamental Interpersonal Relation Orientation-Behavior (FIRO-B) (Shutz, 1978). These three areas were: inclusion—the degree to which a person associates and interacts with others; control—the extent to which a person assumes responsibility or dominates other people (control and power); and affection—the degree to which a person becomes emotionally involved with another (love and affection) (Shutz, 1978).
Interpersonal behavior was also defined as the social behavior of the subjects as directly observed and recorded on the Jesness Behavior Checklist (JBC) (Jesness, 1971). The JBC "encompasses a broad spectrum of nonintellectual, non-cognitive social behaviors" (Jesness, 1971, p. 5). The JBC resulted in scores on 14 bipolar scales (factors), such as friendliness versus hostility, independence versus dependence, and social control versus attention-seeking.

Operational Hypotheses

The hypotheses to be tested by this research were stated in the null form as follows:

1. There will be no significant difference between the mean self-concept scores (as measured by the PHCSC) of the treatment group (participants of the Wilderness Youth Development Program) when compared to the mean self-concept scores of the comparison group (those in traditional detention).

2. There will be no significant difference between the mean locus of control scores (as measured by the Nowicki-Strickland LOC Scale) of the treatment group when compared to the mean locus of control scores of the comparison group.

3. There will be no significant difference between the mean interpersonal orientation scores (as measured by the FIRO-B) of the treatment group when compared to the mean interpersonal orientation scores of the comparison group.

4. There will be no significant difference in the exhibited social behaviors (as measured by the JBC) of the participants as a
result of their participation in the Wilderness Youth Development Program.

Data Collection and Procedure

Subjects in the treatment group (WYD program) were tested on three occasions. The first session, the pretest, occurred at the Regional Youth Development Center on the first day of the course. Subjects were tested as soon as all had arrived at the center. Thus, they had minimal interaction time with other group members or instructors. The subjects were tested as a group. Each participant first received an Informed Consent Form which was then read aloud (see Appendix A). The subjects were informed that the study that they were being asked to participate in was part of school requirements that the author was attempting to fulfill. Further, they were told that this research was designed as an evaluation of the Wolfcreek program. They were informed that their participation was entirely voluntary and independent of their progress in the Wolfcreek program. Any questions that the group members had were answered honestly. They were requested to sign the Consent Form indicating that they understood what was being asked of them.

Three test inventories were then administered to the group one at a time with the experimenter reading each item aloud in order to keep the subjects together and to control for anticipated differences in reading levels. Subjects were encouraged to stop the experimenter at any time they needed clarification. Standardized instructions were read for each test (see Appendix B). The testing session took
approximately 40 minutes.

The second testing session, the posttest, took place on graduation day. The subjects arrived at a Georgia state park from Wolfcreek Wilderness School and were tested prior to any contact with their caseworkers or families. The subjects were reminded of the purpose of the study and then retested following the same procedure.

The third testing occurred 4 to 6 weeks after the end of the course. The three test inventories were mailed to the subject's court service worker who were asked to forward the inventories to the subject. Instructions were provided to the caseworkers and to the subjects. A stamped return envelope was included.

This procedure was repeated for the five courses from which data were collected between February and June 1987. To control for any bias which might occur from the order of test administration, the order of the three inventories was randomly assigned to each group at all three testings.

To provide an additional measure of the social behaviors of the participants, the course instructors were asked to complete the Jesness Behavior Checklist—Observer Form on each youth at the start and end of the course. They were instructed to complete the first checklist within the first 3-5 days of the course. It was felt that this would provide sufficient time for the instructor to get to know each youth and would also be a more representative sample of the youth's behavior than his initial "honeymoon" behavior. The second checklist was completed after the graduation ceremony. Each instructor completed both checklists on each subject and their scores were
averaged to obtain an overall score for each scale.

Subjects in the comparison group (Atlanta Youth Development Center) were tested on two occasions in June 1987. These subjects were randomly selected from the population of the Atlanta YDC after being matched to the Wolfcreek subjects on a rating scale used by the Division of Youth Services. (All youths in the care of the Division of Youth Services are rated in seven areas such as public risk, educational status, and alcohol/drug involvement.) Those subjects that were in the same range of ratings as the Wolfcreek participants were pulled from the master list of YDC residents. A random sample was then selected from that list. In this way, the subjects in this group were thought to be somewhat similar to those actually participating in the WYD program. In fact, many of these youths may at some point be referred to the WYD program.

The comparison subjects were administered the same three test inventories in a pretesting and a posttesting (26 days later). These subjects also were given an Informed Consent Form (see Appendix C), which was read aloud. They were told simply that the author was conducting research to fulfill school requirements and that their participation was being requested to find out how kids their age thought and felt about different things. The tests were administered to groups of approximately 15 youths and, as in the treatment condition, were read aloud and the order of administration randomly assigned.

Subjects in the comparison sample were not tested on a third occasion. These subjects became rather uncooperative during the
second testing. The test results of several subjects were thrown out due to obvious sabotage of the test inventories. It was determined that a subsequent testing would not be well received by these subjects and, if given, would very likely provide spurious data.

Reliability and Validity of Dependent Measures

As was suggested in preceding sections, one of the primary limitations of prior research has been the use of measurement instruments that have had questionable reliability and validity. In the present study, an effort was made to use instruments that had been psychometrically tested and found to have reliability and validity.

The Piers-Harris Children's Self-Concept Scale (PHCSC) was used to measure self-concept. It is an inventory consisting of 80 simply-worded declarative sentences requiring a "yes" or "no" response. In a review of this instrument, Epstein (1985) indicated that recent reliability studies have confirmed and expanded the results of the original studies. The test is considered stable over time with coefficients ranging from .42 to .96 (mean = .73) reported. It has also proven to be internally consistent (coefficients ranging from .88 to .93 have been reported on the total scale). In addition, estimates of content, criterion-related, and construct validity from numerous empirical studies have been acceptable (Jeske, 1985). The instrument produces both a total score and six cluster scores. Research on these six clusters has also shown them to be reliable and valid. Advantages of this inventory included its brevity and the fact that it is written at a third grade level. This was considered
important given that the population to be tested in this study would very likely have a limited attention span and below average reading skills. The PHCSC appeared to be a psychometrically sound instrument worthy of use in the present study. In a recent review, Jeske (1985) concluded that "the Piers-Harris appears to be the best children's self-concept measure currently available" (p. 1170).

As a measure of locus of control orientation, the Nowicki-Strickland Locus of Control Scale was used. This was a 40-item scale developed for children as an alternative to other unreliable instruments. The original split-half reliability estimate was .74 for Grades 9-11. A test-retest coefficient of .71 was reported for students in Grade 10 (3-week interval). Scores on the instrument were not significantly related to social desirability. The construct validity of the instrument was tested through comparison to other measures of locus of control. As expected, significant, but not high, correlations were found between these measures. Since its development, the results of numerous studies have continued to support this scale's utility and validity as a measure of locus of control orientation (Nowicki & Strickland, 1973).

The Fundamental Interpersonal Relation Orientation-Behavior (FIRO-B) has become a widely used instrument "designed to aid persons in developing an awareness of themselves and their relations to other people" (Lifton, 1985, p. 578). It was designed to assess a person's needs for inclusion, control, and affection (as previously defined) in interpersonal situations. The test consists of 54 single statement items to which an individual responds using a 6-point Guttman
type scale. The vocabulary required is fairly simple. While designed for college students and adults, the instrument has been successfully used at the high school level (Lifton, 1985; Shutz, 1978). Lifton (1985) reported the reliability of the FIRO-B to be excellent and the content, criterion-related, and concurrent validity of the instrument to be adequate. Lifton noted that the construct validity of the FIRO-B is its weakest aspect but that it merits continued use in research.

Finally, the Jesness Behavior Checklist (JBC) was included in this study in order to provide information from observers regarding the social behavior of course participants. Little data on the psychometric properties of this instrument is available. A median test-retest reliability coefficient of .42 was reported over a 7-month interval (Jesness, 1971). This is considered reasonable in an instrument such as this which is designed to be sensitive to changes in behavior. No information is available on test-retest reliability over a shorter period of time. The empirical validity of the 14 scales which comprise this checklist is unclear at the present time. Despite this fact, the instrument remained useful for the purposes of the present study, i.e., a tool to provide structure for the observation of the participant's behavior during this experience.

In summary, these four instruments appeared to possess adequate to excellent reliability and validity and their use in the present investigation was appropriate.
Design and Data Analysis

The quasi-experimental design used in the present investigation is the Nonequivalent Untreated Control Group Design with pretest and posttest (Campbell & Stanley, 1963; Cook & Campbell, 1979). The analysis of data from a quasi-experimental nonequivalent groups design is a difficult task. As Huitema (1980) suggested: "The basic problem in analyzing this design . . . is to separate treatment effects from the differences that are due to the non-equivalence of the groups" (p. 308). Unfortunately, there is no one analysis that can best be applied in this particular case. As a result, the goal should be to conduct an analysis that will allow potential biases which might confound the interpretation of the results to be ruled out. To this end, it has been recommended that multiple statistical analyses of the data be performed (Cook & Campbell, 1979; Huitema, 1980). If it is discovered that these different analyses yield similar results, more confidence can be placed in the validity of the overall conclusions. The analysis of this data included t tests on both pretest and posttest scores, paired t tests on the pretest-posttest change scores, and repeated measures analysis of variance to determine the main effects of treatment and time as well as any interaction between the factors. Additional rationale for these analyses is presented in the following chapter along with the results of the analyses.
CHAPTER IV

RESULTS

This chapter presents the results of the statistical analyses that were performed on the data in order to test the experimental hypotheses. The implications of the results of hypothesis testing are discussed in Chapter V.

Pretreatment Equivalence of the Experimental and Comparison Groups

The initial analysis of these data addressed the pretreatment equivalence of the experimental and comparison group pretest means on each dependent measure. A statistical difference between these group means would indicate that for the particular variable in question, the two groups differed (that is, were not equivalent) prior to the application of a particular treatment. This pretreatment non-equivalence would make it difficult to attribute posttest differences to a true treatment effect. On the other hand, the absence of a statistically significant difference suggests that the two groups are equivalent on the particular variable (although even a nonsignificant difference does not rule out the possibility that the groups do differ on some other variable(s) which may have an effect on the posttest scores). An examination of the pretest scores is a necessary starting place in the process of determining the treatment effect. The pretest means, t values, and probabilities for the
experimental and the comparison group dependent measures are presented in Table 1.

Table 1
Student's $t$ Test for Difference in Pretest Scores Between Experimental and Comparison Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Comparison Mean</th>
<th>SD</th>
<th>$t$</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT SC</td>
<td>58.80</td>
<td>10.50</td>
<td>55.28</td>
<td>11.87</td>
<td>-1.46</td>
<td>.170</td>
</tr>
<tr>
<td>Behavior</td>
<td>9.95</td>
<td>3.29</td>
<td>9.93</td>
<td>3.66</td>
<td>-0.03</td>
<td>.980</td>
</tr>
<tr>
<td>Intellectual</td>
<td>11.58</td>
<td>3.80</td>
<td>12.02</td>
<td>3.38</td>
<td>0.57</td>
<td>.570</td>
</tr>
<tr>
<td>Physical</td>
<td>10.93</td>
<td>2.20</td>
<td>10.35</td>
<td>1.88</td>
<td>-1.32</td>
<td>.190</td>
</tr>
<tr>
<td>Anxiety</td>
<td>9.97</td>
<td>3.07</td>
<td>8.88</td>
<td>3.58</td>
<td>-1.52</td>
<td>.130</td>
</tr>
<tr>
<td>Popularity</td>
<td>9.81</td>
<td>1.95</td>
<td>8.33</td>
<td>2.35</td>
<td>-3.21</td>
<td>.002*</td>
</tr>
<tr>
<td>Happiness</td>
<td>8.48</td>
<td>1.54</td>
<td>7.93</td>
<td>1.86</td>
<td>-1.52</td>
<td>.130</td>
</tr>
<tr>
<td>LOC</td>
<td>14.23</td>
<td>5.22</td>
<td>15.80</td>
<td>5.40</td>
<td>1.38</td>
<td>.170</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>9.09</td>
<td>3.88</td>
<td>7.11</td>
<td>3.43</td>
<td>-2.54</td>
<td>.010*</td>
</tr>
<tr>
<td>Affection</td>
<td>6.53</td>
<td>3.38</td>
<td>6.11</td>
<td>3.52</td>
<td>-0.58</td>
<td>.750</td>
</tr>
<tr>
<td>Control</td>
<td>6.95</td>
<td>2.27</td>
<td>5.75</td>
<td>2.72</td>
<td>-2.23</td>
<td>.030*</td>
</tr>
</tbody>
</table>

Self-Concept

An examination of the data in Table 1 shows that the total self-concept (TOT SC) scores of these two groups did not differ significantly although at pretest the comparison group had a slightly lower
mean self-concept than the experimental group. Among the six self-concept subscales, only Popularity was significantly lower in the comparison group. The experimental and comparison groups may be considered equivalent on this dependent variable at the beginning of the experiment.

**Locus of Control Orientation**

This same equivalence held true for the locus of control (LOC) variable. Inspection of Table 1 again shows that although there was no statistically significant pretest difference between the two groups the comparison group did score in a slightly higher external direction. Pretest equivalence is assumed for this variable as well.

**Interpersonal Need**

Finally, t tests were performed on the scales of the Fundamental Interpersonal Orientation Inventory-Behavior (FIRO-B). For two of the three interpersonal needs measured by this scale there appeared to be significant pretest differences between the two groups. At the time of pretesting, the experimental group had significantly higher measured needs for both Affection and Control than did the comparison group. This indicated that the two groups differed in their self-reported needs for affection and control prior to the treatment, a fact which confounds any interpretation of posttreatment differences on these two variables.
The next step in the analysis of the data was an examination of the posttest differences among the group means on the dependent variables (again using Student's t statistic). These results are summarized in Table 2.

### Table 2

**Student's t Test for Difference in Posttest Scores Between Experimental and Comparison Groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental Mean</th>
<th>SD</th>
<th>Comparison Mean</th>
<th>SD</th>
<th>t</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot SC</td>
<td>59.91</td>
<td>10.61</td>
<td>59.35</td>
<td>10.71</td>
<td>-0.24</td>
<td>.81</td>
</tr>
<tr>
<td>Behavior</td>
<td>10.51</td>
<td>3.47</td>
<td>10.71</td>
<td>3.23</td>
<td>0.28</td>
<td>.78</td>
</tr>
<tr>
<td>Intellectual</td>
<td>12.51</td>
<td>3.55</td>
<td>13.31</td>
<td>2.68</td>
<td>1.19</td>
<td>.24</td>
</tr>
<tr>
<td>Physical</td>
<td>11.12</td>
<td>2.340</td>
<td>10.77</td>
<td>1.628</td>
<td>-0.79</td>
<td>.43</td>
</tr>
<tr>
<td>Anxiety</td>
<td>10.25</td>
<td>3.20</td>
<td>9.93</td>
<td>2.65</td>
<td>-0.52</td>
<td>.61</td>
</tr>
<tr>
<td>Popularity</td>
<td>9.67</td>
<td>1.95</td>
<td>9.24</td>
<td>2.18</td>
<td>-0.97</td>
<td>.33</td>
</tr>
<tr>
<td>Happiness</td>
<td>8.60</td>
<td>1.31</td>
<td>8.22</td>
<td>1.64</td>
<td>-1.20</td>
<td>.23</td>
</tr>
<tr>
<td>LOC</td>
<td>13.86</td>
<td>5.82</td>
<td>13.84</td>
<td>5.54</td>
<td>-0.02</td>
<td>.99</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>8.09</td>
<td>4.13</td>
<td>6.86</td>
<td>4.19</td>
<td>-1.38</td>
<td>.17</td>
</tr>
<tr>
<td>Affection</td>
<td>6.74</td>
<td>3.90</td>
<td>5.24</td>
<td>3.85</td>
<td>-1.81</td>
<td>.07</td>
</tr>
<tr>
<td>Control</td>
<td>6.04</td>
<td>3.53</td>
<td>5.80</td>
<td>3.24</td>
<td>-0.34</td>
<td>.73</td>
</tr>
</tbody>
</table>
Self-Concept

Inspection of Table 2 reveals that the experimental and comparison posttest mean scores did not differ significantly on total self-concept (TOT SC) nor any of the six self-concept subscales. This leads to the retention of the null hypotheses of no differences between the sample means. Whereas at the time of pretesting, the comparison subjects tended to score lower than the experimental subjects on these scales, on the posttest they scored higher on two subscales than the experimental subjects (Behavior and Popularity). In general, the posttest means for the comparison group regressed toward the experimental group means.

Locus of Control Orientation

As the data in Table 2 suggest, there was again no statistically significant difference between the two groups on the locus of control (LOC) variable. In fact, while both groups shifted to a more internal direction at posttesting, the comparison group mean score shifted to a greater degree. This finding also suggests that the null hypothesis of no difference between the sample means must be retained.

Interpersonal Need

Examination of the data in Table 2 suggests that the significant differences observed at pretest (Affection and Control) were not present on the posttests. Inspection of the means for both groups showed that in most cases the posttest mean scores were lower than
the pretest means. As a result of these nonsignificant differences, the null hypothesis of no difference between the sample means is retained for all three measures of interpersonal need.

Changes Across Time in the Experimental Sample

The next step in the analysis of these data was a series of paired _t_ tests between the pretest and posttest means for each dependent variable as an indication of change occurring over time. Retention of the null hypothesis that there was no difference in the mean scores at pretest and posttest would provide further evidence for the absence of a treatment effect on the dependent variables. Conversely, rejection of this null would lend support to the experimental hypothesis. The results of the paired _t_ tests for the pretest to posttest change in the experimental group are presented in Table 3.

**Self-Concept**

As indicated in Table 3 there was a slight increase in the mean total self-concept (TOT SC) score of the experimental sample; however, this change was not statistically significant. The only statistically significant mean change occurred on the Intellectual/School self-concept subscale. These findings lead to the retention of the null hypothesis and lend support to the conclusion that there was no treatment effect on this variable.
Table 3
Paired t Test on the Mean Difference From Pretest to Posttest for Experimental Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Dif.</th>
<th>Paired t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT SC</td>
<td>1.12</td>
<td>1.29</td>
<td>.21</td>
</tr>
<tr>
<td>Behavior</td>
<td>0.56</td>
<td>1.95</td>
<td>.06*</td>
</tr>
<tr>
<td>Intellectual</td>
<td>0.93</td>
<td>2.43</td>
<td>.02*</td>
</tr>
<tr>
<td>Physical</td>
<td>0.19</td>
<td>0.78</td>
<td>.44</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.28</td>
<td>1.18</td>
<td>.24</td>
</tr>
<tr>
<td>Popularity</td>
<td>-0.14</td>
<td>-0.61</td>
<td>.54</td>
</tr>
<tr>
<td>Happiness</td>
<td>0.12</td>
<td>0.57</td>
<td>.57</td>
</tr>
<tr>
<td>LOC</td>
<td>-0.37</td>
<td>-0.49</td>
<td>.62</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>-1.00</td>
<td>-1.78</td>
<td>.08</td>
</tr>
<tr>
<td>Affection</td>
<td>0.21</td>
<td>0.34</td>
<td>.73</td>
</tr>
<tr>
<td>Control</td>
<td>-0.91</td>
<td>-1.69</td>
<td>.10</td>
</tr>
</tbody>
</table>

Locus of Control Orientation

Inspection of the data in Table 3 shows that there was a shift in the posttest mean locus of control (LOC) score toward a more internal direction in the experimental sample. However, this was not a statistically significant change and supports the conclusion that there was no treatment effect on the locus of control variable.
Interpersonal Need

The data in Table 3 indicate no significant mean changes following the treatment on any of the three interpersonal needs measured by the FIRO-B. As a result, the null hypothesis of no difference between the pretest and posttest mean scores is retained.

Changes Across Time in the Comparison Sample

As with the experimental sample, statistical tests were applied to the comparison sample to test the null hypothesis of no mean difference across time. The results of the paired t tests on the pretest to posttest mean changes over time in the comparison sample are presented in Table 4.

Self-Concept

An examination of total self-concept (TOT SC) variable in Table 4 indicates that there was a mean increase of 4.07 raw points at posttest. This mean change was statistically significant. In addition, statistically significant increases occurred for several of the self-concept subscales (Behavior, Intellectual/School, Anxiety, and Popularity). These data lead to rejection of the null hypothesis. Contrary to expectation, these results seem to suggest that the subjects in the traditional detention program reported significantly enhanced self-concept at the time of posttesting.
### Table 4

**Paired \( t \) Test on the Mean Difference From Pretest to Posttest for Comparison Group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Dif.</th>
<th>Paired ( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT SC</td>
<td>4.07</td>
<td>3.25</td>
<td>.002*</td>
</tr>
<tr>
<td>Behavior</td>
<td>0.78</td>
<td>2.05</td>
<td>.050*</td>
</tr>
<tr>
<td>Intellectual</td>
<td>1.29</td>
<td>2.65</td>
<td>.010*</td>
</tr>
<tr>
<td>Physical</td>
<td>0.42</td>
<td>1.61</td>
<td>.120</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.04</td>
<td>2.72</td>
<td>.009*</td>
</tr>
<tr>
<td>Popularity</td>
<td>0.91</td>
<td>2.95</td>
<td>.005*</td>
</tr>
<tr>
<td>Happiness</td>
<td>0.29</td>
<td>1.11</td>
<td>.270</td>
</tr>
<tr>
<td>LOC</td>
<td>-1.96</td>
<td>-4.06</td>
<td>.000*</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>-0.24</td>
<td>-0.43</td>
<td>.670</td>
</tr>
<tr>
<td>Affection</td>
<td>-0.87</td>
<td>-1.51</td>
<td>.140</td>
</tr>
<tr>
<td>Control</td>
<td>0.04</td>
<td>0.09</td>
<td>.930</td>
</tr>
</tbody>
</table>

**Locus of Control Orientation**

As the data in Table 4 suggest, a statistically significant shift to a more internal locus of control orientation (LOC) was observed for the comparison sample and leads to the rejection of the null hypothesis. As with self-concept, this shift was contrary to the expectation that there would be no change in the scores of the comparison sample.
Interpersonal Need

An examination of the mean scores for the comparison group on the three measures of interpersonal need (displayed in Table 4) indicated no statistically significant changes in the mean scores for any of the three needs. Following the same trend as the experimental sample, the means of these subscales for the most part tended to decrease.

Further Examination of Treatment and Time Effects

The next step in the analysis of these data involved a repeated measures analysis of variance on the pretest and posttest scores for each major dependent measure. This analysis provided an additional assessment of changes that may have occurred over time and treatment. The results of this 2 x 2 analysis provided information on the main effects of both the treatment (experimental versus comparison) and time (pretest versus posttest) as well as on any interaction between treatment and time. An interaction is said to exist when the mean differences among the levels of one factor (treatment) are not constant across the levels of the other factor (time). The summary tables for the individual ANOVA procedure for each dependent variable are presented in Tables 5-15 and discussed below. The implications of these results for the testing of the experimental hypotheses will be discussed in Chapter V.
Table 5
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Total Self-Concept Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>180.6</td>
<td>1</td>
<td>180.6</td>
<td>0.85</td>
<td>.360</td>
</tr>
<tr>
<td>Error</td>
<td>18367.7</td>
<td>86</td>
<td>213.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>295.3</td>
<td>1</td>
<td>295.3</td>
<td>11.39</td>
<td>.001*</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>95.7</td>
<td>1</td>
<td>95.7</td>
<td>3.69</td>
<td>.060</td>
</tr>
<tr>
<td>Error</td>
<td>2230.6</td>
<td>86</td>
<td>25.9</td>
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<td></td>
</tr>
</tbody>
</table>

Table 6
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Behavior Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>0.35</td>
<td>1</td>
<td>0.35</td>
<td>0.02</td>
<td>.900</td>
</tr>
<tr>
<td>Error</td>
<td>1794.50</td>
<td>86</td>
<td>20.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>19.60</td>
<td>1</td>
<td>19.60</td>
<td>7.81</td>
<td>.006*</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>0.53</td>
<td>1</td>
<td>0.53</td>
<td>0.21</td>
<td>.650</td>
</tr>
<tr>
<td>Error</td>
<td>216.19</td>
<td>86</td>
<td>2.51</td>
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</tr>
</tbody>
</table>
Table 7
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Intellectual/School Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>16.91</td>
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<td>16.91</td>
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<td>.340</td>
</tr>
<tr>
<td>Error</td>
<td>1595.81</td>
<td>86</td>
<td>18.67</td>
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<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>54.14</td>
<td>1</td>
<td>54.14</td>
<td>12.72</td>
<td>.001*</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>1.41</td>
<td>1</td>
<td>1.41</td>
<td>0.33</td>
<td>.570</td>
</tr>
<tr>
<td>Error</td>
<td>366.02</td>
<td>86</td>
<td>4.26</td>
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</tr>
</tbody>
</table>

Table 8
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Physical Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
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<th>p</th>
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</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>9.17</td>
<td>1</td>
<td>9.17</td>
<td>1.34</td>
<td>.25</td>
</tr>
<tr>
<td>Error</td>
<td>587.55</td>
<td>86</td>
<td>6.83</td>
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</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Time</td>
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<td>4.07</td>
<td>2.92</td>
<td>.09</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>0.61</td>
<td>1</td>
<td>0.61</td>
<td>0.44</td>
<td>.51</td>
</tr>
<tr>
<td>Error</td>
<td>119.74</td>
<td>86</td>
<td>1.39</td>
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</table>
Table 9
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Anxiety Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
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<th>p</th>
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</thead>
<tbody>
<tr>
<td>Between subjects</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Experiment</td>
<td>21.87</td>
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<td>21.87</td>
<td>1.25</td>
<td>.270</td>
</tr>
<tr>
<td>Error</td>
<td>1510.13</td>
<td>86</td>
<td>17.56</td>
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<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>19.26</td>
<td>1</td>
<td>19.26</td>
<td>8.44</td>
<td>.005*</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>6.44</td>
<td>1</td>
<td>6.44</td>
<td>2.82</td>
<td>.100</td>
</tr>
<tr>
<td>Error</td>
<td>196.28</td>
<td>86</td>
<td>2.28</td>
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</table>

Table 10
Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Popularity Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
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<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>40.13</td>
<td>1</td>
<td>40.13</td>
<td>5.47</td>
<td>.020*</td>
</tr>
<tr>
<td>Error</td>
<td>630.86</td>
<td>86</td>
<td>7.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>6.55</td>
<td>1</td>
<td>6.55</td>
<td>3.98</td>
<td>.050*</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>12.13</td>
<td>1</td>
<td>12.13</td>
<td>7.38</td>
<td>.008*</td>
</tr>
<tr>
<td>Error</td>
<td>141.40</td>
<td>86</td>
<td>1.64</td>
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<td></td>
</tr>
</tbody>
</table>

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### Table 11

Summary of Repeated Measures ANOVA on Pre and Post Piers-Harris Happiness Subscale Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>9.66</td>
<td>1</td>
<td>9.66</td>
<td>2.43</td>
<td>.12</td>
</tr>
<tr>
<td>Error</td>
<td>341.77</td>
<td>86</td>
<td>3.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>1.80</td>
<td>1</td>
<td>1.80</td>
<td>1.49</td>
<td>.22</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>0.33</td>
<td>1</td>
<td>0.33</td>
<td>0.27</td>
<td>.60</td>
</tr>
<tr>
<td>Error</td>
<td>103.83</td>
<td>86</td>
<td>1.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 12

Summary of Repeated Measures ANOVA on Pre and Post Nowicki-Strickland Locus of Control Scores

<table>
<thead>
<tr>
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<th>MS</th>
<th>F</th>
<th>p</th>
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<tbody>
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<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
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<td>26.5</td>
<td>0.51</td>
<td>.47</td>
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<td>51.9</td>
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<td></td>
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<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>59.6</td>
<td>1</td>
<td>59.6</td>
<td>6.89</td>
<td>.01*</td>
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<td>Time x treatment</td>
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<td>27.6</td>
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<tr>
<td>Error</td>
<td>743.9</td>
<td>86</td>
<td>8.7</td>
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Table 13
Summary of Repeated Measures ANOVA on Pre and Post FIRO-B Inclusion Scores

<table>
<thead>
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<th>SS</th>
<th>df</th>
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</thead>
<tbody>
<tr>
<td>Between subjects</td>
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<td></td>
<td></td>
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<td>Experiment</td>
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<td>1</td>
<td>113.2</td>
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<td>Error</td>
<td>2033.7</td>
<td>86</td>
<td>2033.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>17.0</td>
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<td>Time x treatment</td>
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<td>6.3</td>
<td>0.88</td>
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</tr>
<tr>
<td>Error</td>
<td>611.2</td>
<td>86</td>
<td>7.1</td>
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</table>

Table 14
Summary of Repeated Measures ANOVA on Pre and Post FIRO-B Affection Scores

<table>
<thead>
<tr>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>40.7</td>
<td>1</td>
<td>40.7</td>
<td>2.11</td>
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<tr>
<td>Error</td>
<td>1656.5</td>
<td>86</td>
<td>19.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Time</td>
<td>4.8</td>
<td>1</td>
<td>4.8</td>
<td>0.62</td>
<td>.43</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>12.7</td>
<td>1</td>
<td>12.7</td>
<td>1.65</td>
<td>.20</td>
</tr>
<tr>
<td>Error</td>
<td>663.2</td>
<td>86</td>
<td>7.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 15
Summary of Repeated Measures ANOVA on Pre and Post FIRO-B Control Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment</td>
<td>22.9</td>
<td>1</td>
<td>22.9</td>
<td>1.96</td>
<td>.17</td>
</tr>
<tr>
<td>Error</td>
<td>1008.5</td>
<td>86</td>
<td>11.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
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<td></td>
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<tr>
<td>Time</td>
<td>8.2</td>
<td>1</td>
<td>8.2</td>
<td>1.34</td>
<td>.25</td>
</tr>
<tr>
<td>Time x treatment</td>
<td>9.9</td>
<td>1</td>
<td>9.9</td>
<td>1.63</td>
<td>.21</td>
</tr>
<tr>
<td>Error</td>
<td>524.8</td>
<td>86</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Self-Concept

Inspection of the ANOVA statistics in Table 5 on the total self-concept score (TOT SC) indicated that the null hypothesis of no treatment effect was accepted; however, the null hypothesis of no time effect was rejected since the $F$ value for this variable was significant. However, a significant interaction effect was not observed.

The summary ANOVA tables for the six self-concept subscales are presented in Tables 6-11. An inspection of the data in these six tables indicates that there was a significant main effect of time present on four of these subscales (Behavior, Intellectual/School, Anxiety, and Popularity), while a main effect of treatment was found.
on only the Popularity subscale. In addition, a significant interaction effect was present on this subscale.

**Locus of Control Orientation**

The ANOVA on the locus of control (LOC) variable is summarized in Table 12. Results were similar to those for total self-concept in that the null hypothesis of no treatment effect was retained and the null hypothesis of no time effect was rejected. There was again a nonsignificant interaction effect.

**Interpersonal Need**

As the data in Table 13 suggest, the null hypothesis of no treatment effect on the need for inclusion was rejected. Nonsignificant effects for the main effect of time and the interaction of time and treatment were observed leading to the retention of the null hypotheses.

The ANOVA for the interpersonal need for Affection is presented in Table 14. Both nonsignificant main effects of treatment and time as well as the interaction effect led to retention of the null hypotheses.

Finally, data on the interpersonal need for Control in Table 15 indicate that neither the main effects nor the interaction was statistically significant and again led to retention of the null hypotheses.
Analysis of a Follow-up Effect in the Experimental Sample

A separate analysis was conducted on the follow-up scores of the experimental group. A total of 19 subjects returned the follow-up self-report inventories sent to them 2 months following the completion of the wilderness program. This represented a return rate of 44% of the original subjects. The dependent measure means and standard deviations for these data are presented in Table 16. For purposes of comparison the mean dependent variable scores at pretest and posttest are reproduced in this table. Paired t tests were conducted on the difference between the posttest means and the follow-up means and are summarized in Table 17. The data in Table 17 indicate non-significant differences between the mean follow-up and the mean posttest scores for all dependent variables. All null hypotheses of no mean differences as a result of the treatment were retained. Paired t tests were also conducted on the difference between the follow-up means and the pretest means. These data are summarized in Table 18. As indicated, there was a significant difference only on the Behavior self-concept subscale. No other differences were statistically significant.

Group Leader Ratings of Interpersonal Change in the Participants

The Jesness Behavior Checklist (JBC) was completed on each experimental group subject at the beginning and end of the wilderness experience. To analyze the scores on this checklist, paired t tests on the difference between the pretest and posttest mean scores were
Table 16
Comparison of Means and Standard Deviations for Pretest, Posttest, and Follow-up Dependent Measures (Experimental Group)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest</th>
<th></th>
<th>Posttest</th>
<th></th>
<th>Follow-up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>TOT SC</td>
<td>58.80</td>
<td>10.50</td>
<td>59.91</td>
<td>10.61</td>
<td>60.21</td>
<td>11.97</td>
</tr>
<tr>
<td>Behavior</td>
<td>9.95</td>
<td>3.29</td>
<td>10.51</td>
<td>3.47</td>
<td>11.95</td>
<td>3.27</td>
</tr>
<tr>
<td>Intellectual</td>
<td>11.58</td>
<td>3.80</td>
<td>12.51</td>
<td>3.55</td>
<td>12.95</td>
<td>2.84</td>
</tr>
<tr>
<td>Physical</td>
<td>10.93</td>
<td>2.20</td>
<td>11.12</td>
<td>2.34</td>
<td>11.05</td>
<td>2.09</td>
</tr>
<tr>
<td>Anxiety</td>
<td>9.97</td>
<td>3.07</td>
<td>10.25</td>
<td>3.20</td>
<td>10.21</td>
<td>3.43</td>
</tr>
<tr>
<td>Popularity</td>
<td>9.81</td>
<td>1.95</td>
<td>9.67</td>
<td>1.95</td>
<td>8.95</td>
<td>2.37</td>
</tr>
<tr>
<td>Happiness</td>
<td>8.48</td>
<td>1.54</td>
<td>8.60</td>
<td>1.31</td>
<td>8.47</td>
<td>1.39</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOC</td>
<td>14.23</td>
<td>5.22</td>
<td>13.86</td>
<td>5.82</td>
<td>14.05</td>
<td>5.56</td>
</tr>
<tr>
<td>Inclusion</td>
<td>9.09</td>
<td>3.88</td>
<td>8.09</td>
<td>4.13</td>
<td>8.74</td>
<td>4.16</td>
</tr>
<tr>
<td>Affection</td>
<td>6.53</td>
<td>3.38</td>
<td>6.74</td>
<td>3.90</td>
<td>6.00</td>
<td>3.64</td>
</tr>
<tr>
<td>Control</td>
<td>6.95</td>
<td>2.27</td>
<td>6.04</td>
<td>3.53</td>
<td>5.47</td>
<td>2.52</td>
</tr>
</tbody>
</table>

performed. Since this instrument was only completed on the subjects in the experimental group there is no comparison sample for purposes of analysis. The pretest and posttest mean ratings for each of the 14 scales comprising this instrument are presented in Table 19. The results of the paired t tests on these scales are summarized in Table 20. The data in Table 20 indicate the presence of statistically...
significant mean differences in all but one of the scales (factors) measured by this instrument. Further, these differences, with one exception, were all toward a more socially appropriate and desirable direction. An interpretation of the behaviors and characteristics corresponding to these scales will be provided in Chapter V.

Table 17
Paired t Test on the Mean Difference From Posttest to Follow-up in the Experimental Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Dif.</th>
<th>Std. Error</th>
<th>t</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOT SC</td>
<td>1.16</td>
<td>1.69</td>
<td>0.69</td>
<td>.50</td>
</tr>
<tr>
<td>Behavior</td>
<td>1.10</td>
<td>0.59</td>
<td>1.88</td>
<td>.08</td>
</tr>
<tr>
<td>Intellectual</td>
<td>0.37</td>
<td>0.50</td>
<td>1.88</td>
<td>.47</td>
</tr>
<tr>
<td>Physical</td>
<td>0.32</td>
<td>0.33</td>
<td>0.95</td>
<td>.36</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.63</td>
<td>0.41</td>
<td>1.55</td>
<td>.14</td>
</tr>
<tr>
<td>Popularity</td>
<td>0.47</td>
<td>0.47</td>
<td>-1.01</td>
<td>.32</td>
</tr>
<tr>
<td>Happiness</td>
<td>0.15</td>
<td>0.21</td>
<td>-0.77</td>
<td>.45</td>
</tr>
<tr>
<td>LOC</td>
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<td>1.02</td>
<td>0.26</td>
<td>.80</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>0.84</td>
<td>0.73</td>
<td>1.16</td>
<td>.26</td>
</tr>
<tr>
<td>Affection</td>
<td>-1.63</td>
<td>0.83</td>
<td>-1.95</td>
<td>.07</td>
</tr>
<tr>
<td>Control</td>
<td>0.26</td>
<td>0.58</td>
<td>0.45</td>
<td>.66</td>
</tr>
</tbody>
</table>
Table 18

Paired \( t \) Test on the Mean Difference From Pretest to Follow-up in the Experimental Group

<table>
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<tr>
<th>Variable</th>
<th>Mean Dif.</th>
<th>Std. Error</th>
<th>( t )</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Behavior</td>
<td>1.21</td>
<td>0.49</td>
<td>1.79</td>
<td>.02*</td>
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<td>0.80</td>
<td>1.79</td>
<td>.09</td>
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<tr>
<td>Physical</td>
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<td>0.29</td>
<td>.78</td>
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<tr>
<td>Anxiety</td>
<td>0.31</td>
<td>0.38</td>
<td>0.83</td>
<td>.42</td>
</tr>
<tr>
<td>Popularity</td>
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<td>0.47</td>
<td>-1.80</td>
<td>.09</td>
</tr>
<tr>
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<td>0.40</td>
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<td>.90</td>
</tr>
<tr>
<td>LOC</td>
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<td>1.14</td>
<td>-0.83</td>
<td>.42</td>
</tr>
<tr>
<td>FIRO-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion</td>
<td>0.05</td>
<td>0.87</td>
<td>0.06</td>
<td>.95</td>
</tr>
<tr>
<td>Affection</td>
<td>-0.89</td>
<td>0.85</td>
<td>-1.05</td>
<td>.31</td>
</tr>
<tr>
<td>Control</td>
<td>-1.11</td>
<td>0.58</td>
<td>-1.92</td>
<td>.07</td>
</tr>
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</table>

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Table 19

Means and Standard Deviations for Prerating and Postrating on the Jesness Behavior Checklist Scales (Experimental Group)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Prerating</th>
<th>Postrating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>SD</td>
</tr>
<tr>
<td>Unobtrusiveness</td>
<td>60.42</td>
<td>9.52</td>
</tr>
<tr>
<td>Friendliness</td>
<td>45.42</td>
<td>10.14</td>
</tr>
<tr>
<td>Responsibility</td>
<td>50.86</td>
<td>11.71</td>
</tr>
<tr>
<td>Considerateness</td>
<td>55.44</td>
<td>10.01</td>
</tr>
<tr>
<td>Independence</td>
<td>48.81</td>
<td>14.07</td>
</tr>
<tr>
<td>Rapport</td>
<td>52.09</td>
<td>9.96</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>50.23</td>
<td>9.35</td>
</tr>
<tr>
<td>Sociability</td>
<td>51.63</td>
<td>9.62</td>
</tr>
<tr>
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<td>42.30</td>
<td>11.15</td>
</tr>
<tr>
<td>Calmness</td>
<td>46.70</td>
<td>10.88</td>
</tr>
<tr>
<td>Communication</td>
<td>43.67</td>
<td>9.91</td>
</tr>
<tr>
<td>Insight</td>
<td>51.26</td>
<td>10.59</td>
</tr>
<tr>
<td>Social control</td>
<td>44.77</td>
<td>8.56</td>
</tr>
<tr>
<td>Anger control</td>
<td>45.86</td>
<td>10.53</td>
</tr>
</tbody>
</table>
Table 20
Paired t Test on the Mean Difference From Prerating to Postrating on the Jesness Behavior Checklist Scales (Experimental Group)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Dif.</th>
<th>Std. error</th>
<th>t</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unobtrusiveness</td>
<td>-11.56</td>
<td>1.69</td>
<td>-6.85</td>
<td>.0001</td>
</tr>
<tr>
<td>Friendliness</td>
<td>5.65</td>
<td>1.12</td>
<td>5.04</td>
<td>.0001</td>
</tr>
<tr>
<td>Responsibility</td>
<td>9.40</td>
<td>1.41</td>
<td>6.68</td>
<td>.0001</td>
</tr>
<tr>
<td>Considerateness</td>
<td>12.12</td>
<td>1.69</td>
<td>7.13</td>
<td>.0001</td>
</tr>
<tr>
<td>Independence</td>
<td>9.02</td>
<td>1.91</td>
<td>4.72</td>
<td>.0001</td>
</tr>
<tr>
<td>Rapport</td>
<td>10.16</td>
<td>1.39</td>
<td>7.33</td>
<td>.0001</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>7.74</td>
<td>1.13</td>
<td>6.83</td>
<td>.0001</td>
</tr>
<tr>
<td>Sociability</td>
<td>5.77</td>
<td>1.04</td>
<td>5.53</td>
<td>.0001</td>
</tr>
<tr>
<td>Conformity</td>
<td>8.72</td>
<td>1.12</td>
<td>7.82</td>
<td>.0001</td>
</tr>
<tr>
<td>Calmness</td>
<td>6.58</td>
<td>1.03</td>
<td>6.39</td>
<td>.0001</td>
</tr>
<tr>
<td>Communication</td>
<td>16.74</td>
<td>2.12</td>
<td>7.91</td>
<td>.0001</td>
</tr>
<tr>
<td>Insight</td>
<td>-2.39</td>
<td>1.56</td>
<td>-1.54</td>
<td>.1300</td>
</tr>
<tr>
<td>Social control</td>
<td>5.60</td>
<td>0.98</td>
<td>5.71</td>
<td>.0001</td>
</tr>
<tr>
<td>Anger control</td>
<td>3.47</td>
<td>1.08</td>
<td>3.19</td>
<td>.0030</td>
</tr>
</tbody>
</table>
CHAPTER V

DISCUSSION

The purpose of this study was to examine the effects of a 26-day wilderness program for delinquent adolescent males on three psychological constructs: self-concept, locus of control orientation, and interpersonal orientation and behavior. Given the quasi-experimental nature of most prior research in this area these constructs needed additional experimental study. The review of the literature presented in Chapter II indicated that many evaluations of adventure program outcomes have been limited in a number of ways. A few of the more significant problems include the use of limited outcome measures and unreliable dependent measurement instruments, heavy reliance upon personal observation, small sample sizes, and other design problems.

In the present investigation an attempt was made to improve upon past research through the use of reliable and psychometrically sound measurement instruments and a larger sample size than many previous investigations. In addition, an attempt was made to measure the short-term lasting effects of participation in a wilderness program and to explore the effect that participation has on the interpersonal behavior of delinquent youths (an area revealed by the review of the literature to be in need of further study). The findings of this study have theoretical significance inasmuch as there is an increased understanding of the psychological and behavioral changes that occur
as a result of participation in this kind of experiential program. Furthermore, the implications of these findings have practical significance for the continuing treatment of adjudicated "at risk" adolescents. The results of the present investigation will be discussed in the context of the four research questions that this investigation sought to answer.

**Effects of Participation on Self-Concept**

The first research question addressed in the present investigation was: Will delinquent adolescents who participate in a 26-day wilderness/adventure program show more improvement in self-concept than adolescents in a comparison group participating in a traditional detention program? In the null form, the operational hypothesis stated: There will be no significant difference between the mean self-concept scores of the treatment group when compared to the mean scores of the comparison group. To answer this research question it is necessary to study both the overall self-concept scores and the subscale self-concept scores. This distinction is consistent with previously cited research which has suggested that there are both general (the total self-concept score) and specific (the subscale scores) dimensions to the self-concept (Marsh et al., 1984; Marsh et al., 1983, Shavelson & Bolus, 1982; Shavelson et al., 1976).

**Effects of Participation on Total Self-Concept**

The results of this analysis indicate that the null hypothesis for no difference in overall (or general) self-concept must be
retained. There was no support in the current study that the overall self-concept of the experimental subjects increased in the predicted direction compared to the comparison sample. In fact, there appeared to be greater improvement in self-concept of those in the traditional detention program.

An examination of the results of the statistical analyses performed on the data will support this conclusion. The results of the initial t test for the difference between the experimental and comparison sample pretest self-concept score (Table 1) suggested that these groups were equivalent on this variable at the beginning of the study. Further analysis indicated that there was a nonsignificant difference between the total self-concept scores of the experimental and comparison samples at posttest (Table 2). Although not significant, the overall mean self-concept of the experimental subjects was somewhat higher at the outset than the mean self-concept of the comparison subjects. This trend for a higher initial self-concept in the experimental sample may have been the result of a "Hawthorne Effect," i.e., the fact that these subjects were singled out for this special program could have contributed to generally more positive feelings they experienced about themselves. In addition, because of the experimental sample's higher mean score, a "ceiling effect" would have prevented further increase at the posttest. Both of these factors introduced potential bias into the research design and may have interfered with any true treatment effect.

Pretest-posttest change scores for total self-concept of the experimental group were then analyzed and it was ascertained that
there was no significant change over time for the experimental group (Tables 3 and 4). On the contrary, there was a statistically significant increase in the mean total self-concept of the comparison sample between the testings. This result was reinforced by the results of the repeated measures ANOVA which yielded a nonsignificant overall treatment effect but a significant effect for time (Table 5). This main effect for time seems to have resulted from the significant increase in the mean score of the comparison sample from pretest to posttest.

In sum, the results of the present investigation indicated that the 26-day wilderness experience had no effect on the measured total self-concept of the participants.

Effects of Participation on Specific Dimensions of Self-Concept

The subscales of the PHCSC seem to correspond to the major dimensions that contribute to the total self-concept. Previously cited theory (Marsh et al., 1984; Marsh et al., 1983; Shavelson & Bolus, 1982; Shavelson et al., 1976) suggests that for change to occur in overall, or general, self-concept it must first occur on the specific dimensions. To the extent that changes do occur in the specific dimensions there is a greater likelihood that the more stable general self-concept will be altered.

The results of the present investigation lead to the retention of the null hypotheses of no differences between the means for each of these subscales. There was no support for the research hypothesis that experimental subjects exhibited greater improvement in the
specific dimensions of their self-concepts than the comparison subjects. In fact, contrary to expectation, the results indicated increases in several specific aspects of the self-concepts of subjects in traditional detention.

As was the case with the total self-concept score, the results of the t tests indicated pretreatment equivalence between the experimental and the comparison groups for all the subscales except Popularity (Table 1). Posttesting indicated no significant differences between the experimental and the comparison samples on any of the six subscales (Table 2). The experimental group experienced a statistically significant increase on the Intellectual/School subscale indicating that the youths developed a better concept of themselves in school tasks (Table 3). However, a similar statistically significant increase occurred in the comparison sample (Table 4). In the experimental sample, none of the remaining self-concept subscales shifted significantly.

The results of the repeated measures ANOVA on the subscales support the general absence of a treatment effect on the specific measures of self-concept (Tables 6-11). Only the ANOVA on the Popularity subscale produced a significant treatment effect (Table 10). This finding is somewhat difficult to interpret given the significant interaction of the treatment and time main effects. This interaction effect would be a chance effect at the .05 level of significance and may to some extent be an artifact of the number of repeated ANOVAs performed on these data. In any case, examination of the sample means indicated that the pretest mean of the comparison group on the
Popularity subscale was significantly lower than the experimental group. While this mean score increased significantly over time for the comparison group, there was a decrease (although nonsignificant) in the mean for the experimental group at posttest on this subscale. It is concluded that there was no significant effect on this subscale as a result of the wilderness experience. As previously indicated, the only effect of the treatment seemed to be an increased Intellectual/School self-concept in the experimental subjects. However, interpretation of this effect is confounded by a similar increase on this subscale by the comparison sample.

As reported in the preceding chapter, there were, however, several significant pretest-posttest changes in the self-concept subscales scores of the comparison sample (Table 4). The subjects in the comparison sample acknowledged fewer behavioral difficulties (Behavior subscale), reported better concepts of themselves in school-related tasks (Intellectual/School subscale), reported less general emotional disturbance and dysphoric mood (Anxiety subscale), and reported less shyness or interpersonal difficulties (Popularity subscale). The results of the repeated measures ANOVA indicated significant time effects on these four subscales as well (Tables 6, 7, 9, and 10). Examination of the cell means indicates that these effects were largely the result of the significant mean pretest to posttest changes among the comparison subjects.

In summary, as with the measure of total self-concept, the results of the analysis of these subscale scores again seem to contradict the prediction that there would be greater improvement in the
self-concept scores of those who participated in this alternative treatment program. The only specific aspect of self-concept that may have been affected by participation in this program was the Intellectual/School self-concept. This interpretation, however, is tempered by the fact that a similar change occurred in the comparison sample. Finally, contrary to prediction there did seem to be several increases in specific dimensions of self-concept among the subjects who were in the traditional detention program.

Effects of Participation on Follow-up Self-Concept Scores

One of the aims of the present investigation was an examination of the follow-up effects of participation in the wilderness program. The research question asked whether there would be continuing positive effects on the self-concept of the participants in the wilderness experience. (Initially, the design called for a follow-up testing for the comparison sample; but as reported in Chapter III, this testing was not attempted due to increasing noncompliance by the subjects.) Statistical analyses were directed to test the null hypothesis of no difference between the posttest means and the follow-up means on total self-concept and the six dimensions of self-concept. Differences were also tested between the pretest means and the follow-up means on total self-concept and the six self-concept factors. The analyses of these data indicated that no statistically significant effects were present between the follow-up self-concept scores and the posttest scores of the experimental sample (Table 7). This leads to the retention of the null hypothesis of no difference.
between the mean scores across time. As reported, however, there was
a significant pretest to follow-up difference between the mean score
on the Behavior subscale (Table 8) indicating that the participants
of this program seemed to gain a better concept of themselves behaviorally. Whether this self-report of fewer behavioral difficulties translates into more socially appropriate and functional overt behavior is not known. This improvement could only be validated through
the report of caseworkers/parents or in a lowered recidivism rate for
these subjects—all of which goes beyond the scope of the present investigation. At this point, attributing this change to the treatment would be presumptuous since many other intervening events may have occurred between the end of the course and the follow-up. In
general, there appeared to be no lasting (or delayed) positive treatment effect on the measured self-concepts of the participants in the wilderness program.

Validity of Conclusions

There are a number of threats to the validity of conclusions regarding the effect of this program on the participant's self-concepts. An examination of the mean self-concept scores seemed to indicate that the subjects in both the experimental and comparison sample may have exaggerated their report of the way they feel about themselves. The means for both the experimental and the comparison sample were high when compared to the normative sample of 1,183 small town Pennsylvania public school children. The reported overall norm for total self-concept is 51.84 (49.67 for 10th graders). This
compares to a mean score of 58.80 for the experimental group and 55.28 for the comparison group in the present study. The confidence interval (68%) for the total score is +/-4.39 suggesting that the mean scores for both of these groups are at the upper limit or well beyond this confidence interval. This same trend was also noted in the subscale mean scores although to a lesser degree.

Inspection of the raw scores suggested that there were a number of outlier scores that seemed to extend well beyond the self-concept expected in this population and which pushed the means higher for both samples. This suggests that many of the subjects, especially those in the comparison sample, experienced a negative reaction to being the object of experimental scrutiny (i.e., a "guinea pig effect"). As a result the subjects may have responded defensively or in a socially desirable manner to the self-concept inventory and in the process may have exaggerated their reports of the way they actually feel about themselves. These inflated estimates probably biased the means in a way that either washed out any treatment effects and/or yielded fallacious and spurious data. Doubt is then cast on what appears to be the obvious conclusion that there was no effect of this treatment on the measured self-concepts of the participants in the 26-day wilderness program.

The present investigation highlights the pitfalls of self-report data and the difficulties testing a delinquent population. Future researchers investigating self-concept in this population will need to find ways to obtain more accurate self-reports. Researchers should also consider more inferential methods such as direct
behavioral observation or face-to-face interview in order to obtain more valid and realistic measures of self-concepts.

Effects of Participation on Locus of Control Orientation

The second research question addressed in the present investigation was: Will delinquent adolescents who participate in a 26-day wilderness/adventure program exhibit a more internal locus of control orientation than adolescents in a comparison group who participate in a traditional detention program? In the null form, the operational hypothesis stated: There will be no significant difference between the mean locus of control scores of the treatment group when compared to the mean scores of the comparison group.

The theoretical basis for the research hypothesis that participation in this type of wilderness/adventure program would lead to more internal locus of control (LOC) was established in the review of the literature in Chapter II. It was anticipated that, in contrast to their detention counterparts, the participants in this alternative program would begin to see themselves as more in control of their environment and its reinforcements.

The results of this study lead to the retention of the null hypothesis of no difference between the group means and fail to support the research hypothesis that participation in this type of program has a noticeable effect on the measured LOC. Initially, both the experimental and comparison groups mean LOC scores were not significantly different. These differences remained insignificant at the posttest ($p < .99$, Tables 1 and 2). The mean LOC score of the
experimental sample did shift in a more internal direction at the posttest (from 14.23 to 13.86) although this shift was not statistically significant ($p < .62$, Table 3). There was, however, a significant shift to a more internal LOC orientation in the pretest-posttest means of the comparison group (from 15.80 to 13.84) ($p < .000$, Table 4). This indicated that the experimental and comparison groups became even more equivalent in their LOC orientation at posttest than at pretest.

The conclusion that there was no treatment effect on LOC orientation was further supported by the results of the repeated measures ANOVA on this variable. The results of this analysis indicated that there was a nonsignificant treatment effect but a significant effect over time (Table 12). Inspection of the means shows that the significant main effect of time appears to be the result of the significant mean change which occurred between testings in the comparison group.

Examination of the follow-up data for the experimental subjects suggests that the LOC orientation of these subjects shifted back to a more external level ($mean = 14.05$, Table 13). It is noted, however, that this difference was not statistically significant when compared to both the pretest and the posttest means (Tables 14 and 15). From this analysis it is concluded that, as with self-concept, there was no follow-up or delayed effect on the locus of control orientation of the wilderness program participants.

The apparent conclusion drawn from this analysis is that during the 26-day period the members of the comparison group came to see
themselves as more in control of environmental events. In contrast, there was no such change in the LOC orientation of the participants in the wilderness experience. It is possible, however, that a regression effect may have accounted for the statistically significant pretest-posttest shift in the comparison group means. If this were the case, the effect observed cannot be attributed to detention treatment. Inspection of the norms reported for this scale is helpful in determining whether a regression effect threatens the validity of these results. In the present investigation a pretest mean score of 15.80 and a posttest mean score of 13.84 were obtained for the comparison sample. This shift across time does represent a regression to the average normative mean of 12.78 for high school students reported by the test authors (Nowicki & Strickland, 1973). The evidence suggests that it was a regression effect that accounted for the significant change in the LOC orientation of the comparison sample. As a result, it cannot be concluded that the detention treatment influenced the LOC beliefs of the comparison sample.

An additional threat to the validity of the LOC results centers on the accuracy of the self-report of the subjects. It was anticipated that adolescents with a history of delinquent behavior would report more external LOC orientation than was observed in this study. Since the accuracy of these subjects self-reported self-concepts is in doubt, it seems possible that the obtained LOC scores do not accurately reflect the nature of these youths' control beliefs. If the self-reported LOC orientation of these subjects were invalid, then the interpretation of these data would also be specious.
In summary, the results of the present investigation revealed no treatment effect on the LOC orientation of the wilderness participants. However, given the exploratory nature of this study, firm conclusions should not be drawn without further study.

Effects of Participation on Interpersonal Orientation and Behavior

The third and fourth research questions addressed the issue of the effects of the wilderness program on the interpersonal behaviors of the participants. The third research question asked: Will delinquent adolescents who participate in the wilderness/adventure program report higher needs for inclusion and affection and a lower need for control than adolescents in a comparison group participating in a traditional detention program? In the null form, the third operational hypothesis stated: There will be no significant difference between the mean scores of interpersonal orientation of the treatment group when compared to the mean scores of the comparison group.

An effort was made to answer the third research question using the Fundamental Interpersonal Relationship Orientation-Behavior (FIRO-B). Recall that the FIRO-B provides scores on three primary needs thought to underlie all interpersonal behavior— inclusion (the need to establish and maintain a satisfying relationship with people with respect to interaction and association), affection (the need to establish and maintain a satisfying relationship with respect to love and affection), and control (the need to establish and maintain a satisfying relationship with respect to power and control). These
needs can best be understood by the analogy of a group riding in a boat. The interpersonal need for inclusion influences the decision of the individual to go on the boat ride. The interpersonal need for control influences the decision as to who will run the boat. The interpersonal need for affection influences whether or not any close relations develop between the pairs of individuals on the boat (Shutz, 1978).

In the present investigation it was hypothesized that as a result of the wilderness experience there would be an increase in the mean inclusion and affection scores and a decrease in the mean control scores of the participants. It was expected that the youths would become more open to close relationships (need for affection) and want to be included in group activities (need for inclusion) as a result of the group experiences and trust building that would occur in the wilderness. Conversely, it was expected that as a result the wilderness experience these youths would have a decreased need for control as they learned to trust and rely on others.

The Need for Inclusion

The null hypothesis of no difference between the mean inclusion scores for the treatment and the comparison group was retained as a result of the analysis of the present data. Data obtained in the present investigation failed to support the research hypotheses that the wilderness program would influence the participants in a way that would cause them to be more open to interpersonal contact. A closer examination of the results of the analysis will provide support for
this conclusion.

At the pretest the experimental and the comparison groups differed significantly on the need for inclusion (Table 1). At the pretest, the comparison group expressed a stronger preference for being alone while the experimental group was more open to interpersonal contact. These differences between the experimental and comparison group mean scores were not present at the posttest (Table 2). Additionally, there were no significant mean changes across time on this need in either the experimental group or the comparison group (Tables 3 and 4). However, there was a trend toward a decrease in the self-reported need for inclusion (interpersonal contact). The results of these initial analyses lead to the retention of the null hypothesis of no difference between the sample means.

The repeated measures ANOVA procedure performed on these data appears at first glance to contradict this finding (Table 13). The results of the ANOVA indicated a significant treatment effect for the inclusion need. However, given the pretreatment nonequivalence of the groups it is very likely that some bias affected the overall main effects analysis of variance. It is interesting to note that if the results of this ANOVA are valid, the observed treatment effect runs counter to the predicted effect. Since subjects reported a decreased need for inclusion as a result of participation rather than an increased need for inclusion.

Finally, this investigation also addressed the question of the follow-up effect of the treatment over time for the experimental subjects. There did not seem to be an effect at the time of follow-
up for the inclusion need (Tables 16-18) although the experimental group mean did regress to a level that was closer to the initial pretest mean.

In summary, no support was found in the present investigation that participation in the wilderness experience would result in greater openness to interpersonal contact.

The Need for Affection

It was originally hypothesized that as a result of their participation in the wilderness program the youths would be more open to close relationships than the youths in a traditional detention program. However, the results of the data analyses on this need led to the retention of the null hypothesis of no difference between the mean scores for the experimental group and the comparison group. In the present investigation, no empirical support was found for the expectation that the wilderness experience would lead the participants to a greater exchange of affection and warmth. This conclusion was drawn as a result of the statistical analysis of the data as reported in Chapter IV.

A comparison of the means for the experimental and the comparison subjects on need for affection revealed no significant differences between the groups at pretest or at posttest (Tables 1 and 2). At pretest both groups reported a similar need for affection and in both cases this approximated the reported norm of 6.9 (Shutz, 1978). The changes across time for both the experimental and comparison group means were not statistically significant (Tables 3 and 4), and
there was no support of a treatment effect from the repeated measures ANOVA (Table 14). In addition, no follow-up effect was observed for this need (Tables 16-18).

The Need for Control

It was predicted that as a result of the wilderness experience these youths would express a decreased need for interpersonal control as they learned to trust and rely on other group members. To answer this research hypothesis the null hypothesis of no statistical difference between the sample means was tested and the null hypothesis retained.

At pretest there was again a significant difference between the experimental and comparison group means in the need for control (Table 1). The comparison group expressed resistance to others' control over them while the experimental group greater acceptance of being controlled by others. In general, the members of the experimental group reported that they were more open to structure and orders than the members of the comparison group. When compared to the norm, the comparison group mean in this study was consistent with the reported norm of 5.5 for high school students (Shutz, 1978). Thus, the experimental subjects were even more accepting of others' control at pretest than the normative sample. The novel experience which these youths were about to embark upon, an accompanying sense of insecurity, and a need for directions may have influenced these youths' reported openness to others' control.
As with the need for inclusion, a difference between the groups was no longer present at the posttest so that there were no longer statistically significant mean differences between the experimental and the comparison group (Table 2). It is hypothesized that the decreased mean score for the experimental sample reflects the increased confidence of these youths by the end of the experience. This may have caused them to be less in need of external structure and order. It should be noted, however, that this decrease in the reported mean score for the experimental group was not statistically significant and was only a trend. In similar manner, the pretest–posttest change cross time for the comparison group was not statistically significant (Tables 3 and 4). Further, the results of the repeated measures ANOVA on this need supported the absence of significant main effects of time or treatment for the groups (Table 15). Finally, no follow-up effect was found for this need in the experimental group; and in fact, the mean score continued to decrease toward the norm (Tables 16–18).

Thus, as was the case for the other two interpersonal needs, the analysis of these data provided no support for the experimental hypothesis that the wilderness experience would result in a decreased need for interpersonal control as trust increased.

**Summary**

The predicted effect of the wilderness program on these interpersonal needs was not supported for any of the three needs measured by the FIRO-B. These subjects did appear to accurately respond to
this instrument as evidenced by the fact the scores obtained were generally consistent with published norms. Future research might continue to examine how a program of this nature impacts the needs underlying interpersonal behavior.

Additional Effects of Participation on Interpersonal Behavior

The fourth research question also addressed the issue of the effects of the wilderness program on the interpersonal behaviors of the participants. Whereas the third question dealt more with the concept of the interpersonal needs that underlie interpersonal behavior, the fourth question examined the actual overt behavior of the subjects. This fourth research question asked: Will delinquent adolescents who participate in the wilderness/adventure program exhibit more functional interpersonal behaviors as a result of their participation? In the null form, the fourth operational hypothesis stated: There will be no significant differences in the exhibited social behaviors of participants as a result of their participation in the wilderness program.

In an effort to answer this question, the group leaders of each wilderness course completed the Jesness Behavior Checklist—Observer Form (JBC) on each participant before and after the course. The statistical analysis was directed to test the hypothesis of no difference between the mean prerating and the mean postrating. The null hypothesis was rejected for 13 of the 14 scales comprising the JBC (Table 20). Each of these scales will be examined and discussed.
Unobtrusiveness Versus Obtrusiveness

At the time of the initial rating the subjects were reported to be significantly more agreeable, inconspicuous, and less obtrusive than they were at the final rating. Following the wilderness experience the subjects were judged to be more quarrelsome, loud, aggressive, and more likely to agitate. This is the only apparently negative change recorded by the raters. One might question whether this change could not be expected. It would stand to reason that the participants would be observed to be more unobtrusive at the beginning of a course where survival depends on following directions. As the youths became more secure it is probable that they might become more confident and therefore more obtrusive. This scale is designed in such a way that obtrusive behavior is dysfunctional. In the case of these youths, however, more obtrusive behavior seems expected over time and, depending on the extent of such behavior, might even be considered adaptive.

Friendliness Versus Hostility

As a result of the wilderness experience these youths were rated to be significantly more amiable, cooperative, and accepting of their fellow group members.

Responsibility Versus Irresponsibility

The youths were rated to be significantly more responsible at the end of the experience. This responsibility was shown through
work habits including promptness, initiative, and care of equipment.

Considerateness Versus Inconsiderateness

At the end of the experience the leaders indicated that the behavior of the youths was significantly more polite and tactful and that they were more likely to show kindness to others.

Independence Versus Dependence

At the beginning of the experience the youths were somewhat more dependent (i.e., more easily influenced by others) than the normative sample (280 California youths on probation) (Jesness, 1971). This, again seems consistent with previous findings (i.e., these youths' initial self-reported openness to other's control and their initial unobtrusiveness). By the end of the course, however, the youths were rated to be significantly more independent (i.e., attempted to cope with tasks and make decisions without undue reliance on others).

Rapport Versus Alienation

Subjects were said to exhibit significantly more rapport as a result of the wilderness experience. Rapport is defined in this case to be the ability to easily interact with others and to have harmonious relations with authority figures. At the end of the 26-day program the youths were significantly less avoidant of authority and seemed to trust authority more fully. The emphasis that the wilderness program places on group building and group decision-making
combined with the gradual loosening of leader responsibility very likely accounts for this shift.

**Enthusiasm Versus Depression**

There was a significantly positive shift in the youths' rating on this scale indicating that at the end of the program the youths were more cheerful, active, and involved with others.

**Sociability Versus Poor Peer Relations**

The course leaders reported that the participants were more sociable and able to get along well with their peers as a result of the wilderness experience. It may be interesting to note that even after participation these youths were still rated slightly lower on this scale than the mean rating of 59.7 for the 280 probationers comprising the norm group (Jesness, 1971).

**Conformity Versus Nonconformity**

At the outset the youths were rated to be less conforming than the normative group. However, by the end of the course these youths were reported to show a significant increase in their tendency to comply with accepted social conventions and rules. The youths ultimately surpassed the norm of 48.7 for this scale (Jesness, 1971).

**Calmness Versus Anxiousness**

The leaders of the courses rated the youths to be significantly more calm as a result of the experience. This inventory defines
calmness as the presence of self-confidence, composure, personal security, and high self-esteem.

**Effective Communication Versus Inarticulateness**

At the end of the experience the leaders rated the youths as exhibiting a significant increase in their ability to communicate more effectively. The youths seemed more able to express themselves clearly and to listen to others more attentively. The 17-point t-score increase from prerating to postrating as a result of the experience is even more significant given that the prerating of 43.67 for this group was considerably lower than the normative mean of 54.7 (Jesness, 1971).

**Social Control Versus Attention-Seeking**

Social control is demonstrated by the absence of loud, attention-demanding behavior. As a result of the wilderness experience the youths were rated in such a way that indicated a significant decrease in attention-seeking behavior.

**Anger Control Versus Hypersensitivity**

At the end of the experience the youths exhibited a significant increase in their ability to handle frustration in more socially appropriate ways.
Insight Versus Unawareness and Indecisiveness

There was a nonsignificant change from prerating to postrating in the behaviors measured by this scale. An approximately 2-point decrease in the postrating indicated that leaders tended to perceive the youths as more indecisive, exhibiting less effort toward resolving personal problems, and more lacking in accurate self-knowledge. This was, however, only a trend and not a statistically significant decline.

Summary

In general, it appears that from the perspective of the wilderness course leaders, there were positive changes in the social behaviors of the participants. The specific changes have been discussed in detail in the preceding pages. Of the 14 scales that comprise this inventory, only one (Unobtrusiveness vs. Obtrusiveness) shifted to a significantly less socially appropriate direction. However, as discussed, even this shift is potentially consistent with expectations. The other scale in which there was no significant mean change in ratings was the Insight vs. Unawareness scale.

The positive changes observed by the behavior raters in this experiment allow for the rejection of the majority of the null hypotheses of no difference between the mean prerating and mean postrating. Consequently, the research hypothesis which predicted significant changes in the overt social behavior of these youths as a result of their intensive wilderness experience was supported.
Of course, there are inherent problems associated with observational data of this nature. Observer bias is the primary threat to the validity of the conclusion that this program did have an effect on the social behavior of the participants. It is entirely possible that a bias can occur in a situation where the group leaders are doing the behavior rating since the leaders typically have vested personal interest in seeing a program succeed. As a result the leaders prerating may tend toward the negative while their postrating would become more positive regardless of actual changes in the behavior of the youths.

Another problem which threatens the validity of this conclusion is the lack of comparative data on the control sample. It would be inappropriate to conclude that there was a treatment effect if similar improvements occurred in the control sample. Unfortunately, these data were not available. Nevertheless, observational data were gathered on the experimental sample with the realization that any results would be only suggestive.

The conclusion that there was a significant effect of participation on the behavior of these youths must be tempered somewhat because of the threats to the validity of results. Nevertheless, "suggestive" research of this type serves an important function in the experimental process since future investigation can be designed and implemented in an effort to increase confidence about positive effects a wilderness experience has on behavior.
Limitations of the Study

The limitations of this study were delineated at the outset in Chapter I; the central limitation being the threat of selection biases to the internal validity of the conclusions in this quasi-experimental design. This is a problem which all field-based research shares and merely indicates that the conclusions from this type of research are exploratory and suggestive at best. The presence of a selection bias in the present study was especially evident when one considers potential differences in the motivation of the subjects selected for the wilderness experience in contrast to the detention sample. Another potential selection bias arises because the selection of the experimental sample was based upon both subjective and objective determinants. The subjective factors entering into the selection decision may have been indicative of some pre-treatment advantage (for example, attitude, motivation, caring family) for a selected youth which may not have been present in those youths comprising the detention sample.

The other significant limitation of this study involved the validity of the self-reported self-concept and locus of control orientation by the subjects, especially those in the comparison sample. This problem was not anticipated by the present investigator and only highlights the difficulties in studying delinquent populations and obtaining accurate self-report data.
Conclusions and Suggestions for Future Research

The purpose of this study was to evaluate the effects of a 26-day wilderness/adventure program on several psychological constructs demonstrated by a review of the literature to need further study. No support was found for the research hypothesis that there would be improvement in the self-concept of the participants in this program. Explanations provided for the failure to attain experimental support centered on the presence of a "Hawthorne effect" in the experimental sample (i.e., higher self-concept resulted from being singled out in this special program) and the possibility of inaccurate self-reports. As has been indicated, self-concept as a construct has historically been difficult to both define and measure. This problem was acutely felt in the present investigation. As suggested, researchers would be well advised of the potential inaccuracy of self-reported self-concept in designing future studies. The previously cited warning (Combs et al., 1967) which suggested that self-report is not an accurate way to measure self-concept may need to be heeded. Perhaps it will be necessary to rely more heavily on an inferential methodology in measuring this construct especially with delinquent youth. In the present investigation some support for increased self-esteem as a result of participation came from the results of the leader behavior rating. At the end of the 26-day course the participants were rated to be more calm—a trait defined by the presence of self-confidence, personal security, and high self-esteem. The youths were also found to be more friendly, considerate, and enthusiastic, all
behaviors which seem to stem from a sense of personal competence and esteem.

No support was found for the research hypothesis that the participants of this program would gain a more internal locus of control orientation as a result of this experience. While it may seem reasonable that the sense of mastery obtained in this program would help the participants to feel more in control of the world and its reinforcements, this was not shown in the present investigation. Again, it seems likely that these youths underreported the externality of their control beliefs and that this may have biased any actual treatment effect. Consequently, no conclusion should be drawn from the present investigation as to the actual effects that this type of wilderness intervention has on the locus of control orientation of delinquent youth. Further research on this construct seems warranted since the characteristics which correlate with an internal orientation seem to be consistent with the expected effects of a program of this nature.

Additionally, no support was found for the research hypothesis that participation would lead to: (a) an increased need for and openness to interpersonal contact (inclusion), (b) an increased need for more exchange of warmth and affection (affection), and (c) a decreased need for control as the youths came to trust others more fully (control). However, there was support for the research hypothesis that the observed social behaviors of the participants would become more socially appropriate. It was observed and reported by group leaders that these youths began communicating more
effectively and increased their interaction with authorities and peers (became more sociable); followed rules and directions better and were more responsible; exhibited greater social control and anger control; and that, in general, these youths were more self-confident and had higher self-esteem at the end of this experience. It is noted that these effects all reflect the goals and objectives of the Wolfcreek Wilderness Youth Development Program. Because of the observational nature of these changes and possible bias and subjectivity one must be cautious about drawing firm causal conclusions from these data. Earlier cautions regarding overrater bias and the lack of comparison data necessarily temper these conclusions and make these results "suggestive." Nevertheless, there does appear to be an observed positive change in the social behaviors of the participants in this type of experience. Future researchers might continue to use behavioral data of this nature to replicate this study and to examine the continuing postexperience behavior of these subjects after their return to the community. The review of the literature indicated that the interpersonal effects of this type of programming have been a neglected area of study. The present results suggest that further research on these effects would be an appropriate line of study.

Several suggestions for further research have already been offered. Two additional observations are offered at this point and in conclusion. It seems important that future research into the effects of wilderness interventions go beyond the cause and effect, quantitative hypothesis testing that characterizes much of research today. It must be recognized that an intervention such as a
wilderness/adventure experience is not a static intervention with a one-time effect. Part of the difficulty in studying programs of this nature is the attempt to objectify and impose a typical quantitative method of scientific inquiry onto such a program. Furthermore, it has been suggested that qualitative research is an equally appropriate methodology for studying this type of intervention (Bullock, 1983). The difficulties that the present investigator had in obtaining cooperation from subjects makes this type of qualitative research a much more appealing methodology. The focus in qualitative research is on inductive analysis and description rather than deductive analysis and causation. One form that qualitative research can take is participant observation. In this methodology observers in the field attempt to "discover and give meaning to the world as the participants see it, rather than as conceived a priori by the interpreter" (Bullock, 1983, p. 39). Another underused method which seems well-suited to investigation of wilderness effects is in-depth open-ended interviewing of the participant with the goal of arriving at themes, common effects, and experiences (Bullock, 1983). Both of these techniques would appropriately be applied to the study of the effects of a wilderness experience. This methodology would complement the numerous quantitative studies that have been conducted over the years.

Finally, given that science continues to seek cause-and-effect relationships, future researchers must begin to study the specific program components that are thought to underlie the effects of a program of this nature. Researchers must begin analyzing the
specific characteristics of a program such as the content and structure, group dynamics, leadership philosophy and style, the effects of different kinds of challenges, and the role of stress in the experience, to name only a few. Research on these specific variables would guide the activities of program developers and course facilitators in their efforts to implement experiences and to maximize therapeutic impact. Furthermore, such research would lend further understanding and credibility to the field of experiential adventure education as an alternative method of treatment and self-growth.
APPENDICES
Dear WYD Participant:

My name is Tim Zwart. I am a doctoral student at Western Michigan University. I have been contacted by the staff of Wolfcreek to study the program that you are about to go through. To do this I'm going to need your help. Let me tell you a little about this study so that you will know what to expect and how you can help.

It is important to the staff at Wolfcreek to know the reactions of those of you who go through this experience. The best way to find this out is by asking the kids who have gone through it how they think and feel about certain things. That's where you come in.

Before this experience you will be given three sets of questions (about 175 questions all together). The purpose of these is to see how you think and feel about certain things. Some of the questions will be pretty obvious to you. On some you may wonder what this has to do with anything. That's OK. There aren't any right or wrong answers to these questions—we just want your honest answer about how you think or feel about that statement or question. One of the staff members will be close by so that you can ask questions if you don't understand a question or a word. The questions will probably take you less than 45 minutes to answer. This time will be built right into your schedule—so you won't be missing a thing.

At the end of the program we'll ask you to answer these same questions again. Now you might be tempted to try to figure out how you think we want these answered or try to remember how you answered a question the first time and just put down the same answer. Please don't do this—like I said before, there aren't any right answers so it's best if you answer them how you really think or feel.

Two months from now we will be in touch with you again and will ask you to answer the same set of questions one last time.

And that's all there is to it. Your name will not be revealed to anyone and your answers to these questions will not be used in any way against you in court hearings or in progress reports. You may, at any time, decide not to participate in this study. This will in no way effect your participation in the wilderness program. I would hope, though, that once you agree to help me by answering these questions the first time that you will keep helping me at the other times.

If you have any questions about what is expected of you please talk to one of the staff. Your signature at the bottom of this letter will indicate that you understand what you are being asked to do and that you agree to help us in studying this program.

Sincerely,

Tim Zwart

I understand that my participation in this study is totally voluntary.
I understand what is required of me and I agree to answer these questionnaires when they are given to me.

(Your signature)
Appendix B

Test Instructions
Modified Directions for Piers-Harris
Children's Self-Concept Scale

Here are a set of statements that tell how some people feel about themselves. Read each statement and decide whether or not it describes the way you feel about yourself. If it is true or mostly true for you, circle the word "yes" next to the statement. If it is false or mostly false for you, circle the word "no." Answer every question, even if some are hard to decide. Do not circle both "yes" and "no" for the same statement.

Remember there are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

Directions for Nowicki-Strickland Children's Locus of Control Scale

This is not a test—there are no right or wrong answers. We are just trying to find out how kids your age think about certain things.

Please read the 40 questions on the next two pages. If you think your answer should be yes, or mostly yes, circle the "Y" in front of the question. If you think your answer should be no, or mostly no, circle the "N" in front of the question.

Again, there are no right or wrong answers. The more honest you are in your answers, the more useful they will be. If you don't understand a question or need a word explained, please ask one of the staff.

Modified Directions for FIRO-B

The questions on the yellow form ask you to make a choice about how you behave around other people. For each question you are to put a number in the box in front of that question. It is important that you answer these questions with your opinion of how you really behave, not how you think you should behave. Some items might seem similar to others. Each item is different so be sure to answer each item.

Be sure to ask one of the staff for help in case you don't understand a word or the directions.
Appendix C

Informed Consent Form—Comparison Group
Dear Potential Research Volunteer:

My name is Tim Zwart. I am a doctoral student at Western Michigan University. I am asking your help in volunteering to participate in some research I am conducting. Let me tell you a little about this study so that you will know what to expect and how you can help.

Basically, what I am interested in is finding out how kids your age think and feel about a variety of things. The best way to find this out is by asking you directly. That's where you come in.

You will be given three sets of questions (about 175 questions all together). The purpose of these is to see how you think and feel about certain things. Some of the questions will be pretty obvious to you. On some you may wonder what this has to do with anything. That's OK. There aren't any right or wrong answers to these questions—we just want your honest answer about how you think or feel about that statement or question. The questions will probably take you about 30 minutes to answer.

After about a month you will be asked to answer these same questions again. Now you might be tempted to try to figure out how you think we want these answered or try to remember how you answered a question the first time and just put down the same answer. Please don't do this—like I said before, there aren't any right answers so it's best if you answer them how you really think or feel.

Two months later you will be asked to answer the same set of questions one last time.

And that's all there is to it. Your name will not be revealed to anyone and your answers to these questions will not be used in any way against you in court hearings or in progress reports. You may, at any time, decide not to participate in this study, without penalty. I would hope, though, that once you agree to help me by answering these questions the first time that you will keep helping me at the other times.

Your signature at the bottom of this letter will indicate that you understand what you are being asked to do and that you agree to help us in this research.

Thanks for your help!

Tim Zwart

I understand that my participation in this study is totally voluntary. I understand what is required of me and I agree to answer these questionnaires when they are given to me.

(Your signature)


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Tuttle, L., Terry, D., & Shinedling, M. (1975). Note on increase of social interaction of mental patients during a camp trip. Psychological Reports, 36, 77-78.


