

# The Effects of Wilderness Therapy on the Clinical Concerns (on Axes I, II, and IV) of Troubled Adolescents

*Jeffrey P. Clark, Leonardo M. Marmol, Robert Cooley, and Kathleen Gathercoal*

*The purpose of this study was twofold: (a) to empirically evaluate the effects of a 21-day wilderness therapy program (WT) on the defense styles, perceived psychosocial stressors (expressed concerns), dysfunctional personality patterns, clinical syndromes, and maladaptive behaviors of 109 troubled adolescents, as measured by the Defense Style Questionnaire-40, Millon Adolescent Clinical Inventory (MACI), and Youth Outcome Questionnaire-2.0 (Millon, 1997); and (b) to begin to identify the types of clinical concerns on Axes I, II, and IV for which wilderness therapy is most effective. Wilderness therapy resulted in statistically significant improvement on immature defense and maladaptive behavior scores, and on the Expressed Concerns, dysfunctional Personality Patterns, and Clinical Syndromes scores of subjects. Moderate to large effect sizes were found for a wide range of clinical concerns on Axes I, II, and IV. The most striking finding of this study is that WT appears to facilitate positive characterological change in adolescents with clinically elevated MACI Personality Patterns scores. Short-term interventions leading to characterological change are virtually unheard of in the personality literature. Future research is needed to confirm whether or not WT is effective for treating budding personality disorders.*

**Keywords:** Wilderness therapy, Outdoor behavioral healthcare, Adolescent, Personality disorder, Dual diagnosis, Treatment outcome study.

**W**ilderness therapy (WT) is often an intervention of last resort for teens who are in, or headed for, serious trouble. Adolescents sent to WT programs frequently exhibit self-destructive behaviors and typically, have not responded to traditional treatment modalities. Consequently, their parents are often desperately seeking help. One of the reasons these adolescents have not fared well in traditional therapies, the authors posit, is that immature defense styles and dysfunctional personality traits underlie many of their maladaptive behaviors.

The hypothesis for this study grew out of observations made by Kurt Hahn, a wilderness educator and founder of Outward Bound; David Baden-Powell, founder of the Boy Scouts (see Bacon & Kimball, 1989; Willis, 1989); and the principal investigator's own observations working as a wilderness therapist. Hahn and Baden-Powell noticed that physically and emotionally demanding group experiences, outdoors, were particularly effective in bringing about positive characterological change (participants became more resilient, confident, socially responsible, etc.). Despite this, few studies have looked at the effects of WT on personality, and none have looked at WT as a potential treatment for budding personality disorders. While successful short-term interventions are almost unheard of in the personality literature, the authors believe that WT may have more potential for effecting characterological change than most traditional therapies for two reasons: (a) because it is a physically and emotionally demanding experience in which one's safety and personal comfort depend upon adaptive functioning within a group led by quasi-parental treatment providers, and (b) because the psyche has evolved to function optimally in small social groups in a wilderness environment. For these reasons, the authors contend that WT will almost certainly be more effective in facilitating personality change than other short-term interventions. There is some empirical evidence for our hypothesis. Marsh and Richards' (1989) study demonstrated that Outward Bound programs are effective in changing the personality traits of masculinity and

---

*Jeffrey P. Clark, Psy.D., is a Clinical Psychologist with Cornerstone Behavioral Health. Leonardo M. Marmol, Ph.D., is Professor and Chair of the Graduate School of Psychology at Seattle Pacific University. Robert Cooley, Ph.D., is the Executive Director of Catherine Freer Wilderness Therapy Expeditions. Kathleen Gathercoal, Ph.D., is an Associate Professor at George Fox University. Correspondence concerning this article should be addressed to Jeffrey P. Clark, Psy.D., Cornerstone Behavioral Health, P.O. Box 6005, Evanston, WY 82931-6005. Electronic mail may be sent to: [jclark@cornerstonebh.com](mailto:jclark@cornerstonebh.com)*

femininity in both males and females. Gillis and Simpson (1991) found that WT led to marked increases in self-esteem and ego strength. Hanna (1996) discovered that WT helped adolescents develop more positive perceptions of themselves. Porter (1975) found that participants were less defensive and more socially accepting following successful completion of the WT program.

Historically, there has been some blurring between wilderness therapy and wilderness experience (or wilderness adventure) programs. WT is similar to wilderness experience (WE) programs in that both utilize outdoor activities (i.e., backpacking) in a wilderness setting, and teach basic survival skills, but WT differs from WE programs in four ways: (a) WT clients are carefully selected based on clinical assessment, (b) a treatment plan is created for each WT participant, (c) WT clients participate in individual and group therapy sessions that are facilitated by qualified professionals, and (d) WT programs use formal evaluative procedures to assess the progress of participants (Russell & Hendee, 1999).

Traditionally, WT has been considered to be a treatment primarily for juvenile delinquents. Today, few WT participants are diagnosed with conduct disorder, but many of them are oppositional; most of them come from dysfunctional families, and virtually all of them act out in ways that lead to serious difficulties at home, school, and in their relationships with others. The authors believe that the maladaptive behaviors of these teens are often driven by difficulties with affect regulation and impulse control, and dysfunctional ways of perceiving, and relating to self and others. These problematic patterns of thinking, feeling, relating, and behaving may or may not develop into personality disorders, but clinically it makes sense to treat them during adolescence while the individual's characterological structure is still somewhat malleable.

In a recent study that looked at the relationship between romantic relationship dysfunction and symptoms of personality disorder in late adolescent females, Daley, Burge, and Hammen (2000) found that even sub-clinical personality disorder symptoms "[set] the stage for an adverse developmental trajectory" (p. 458), most often characterized by subjects having difficulty establishing and maintaining intimate relationships. Personality disorders take a huge toll on individuals, families, and society—both emotionally and financially—and they are notoriously difficult to treat. "To uproot a personality disorder, the clinician must wrangle with the ballast of a lifetime; a developmental disorder of the entire matrix of the person, produced and perpetuated across the years" (Millon, 1996, p. 173). Because the prognosis for treating personality disorders is generally poor as the individual matures and personality traits become more entrenched, it is critical to identify effective treatments, and intervene as early as possible.

### ***The Purpose and Value of this Study***

The present investigation has two purposes: (a) to empirically evaluate the effects of WT on the immature defense styles, expressed concerns, dysfunctional personality patterns, clinical syndromes, and maladaptive behaviors of troubled adolescents; and (b) to begin to identify the types of clinical concerns on Axes I, II, and IV<sup>1</sup> for which WT is most effective. To date, no study has looked at the effects of WT on troubled adolescents from such a holistic perspective, and few treatment outcome studies take into consideration the complex relationship between environmental stressors, largely non-conscious, intra-psychic defense mechanisms, as well as biophysical symptoms, personality and behavior. Thus, the hypothesis for this study contends that: WT will have a positive effect on the immature defense styles, perceived psychosocial stressors (expressed concerns), dysfunctional personality patterns, clinical syndromes, and maladaptive behaviors of subjects.

### ***Operational Definitions***

**CFWT.** The WT program evaluated for this study was Catherine Freer Wilderness Therapy Expeditions (CFWTE). CFWTE program is a 21-day, dual-diagnosis treatment program that combines naturally healing wilderness settings with: (a) behavior management, (b) a twelve-step approach to both drug and behavior problems, and (c) individual and group psychotherapy drawing on behavioral, cognitive-behavioral, psychodynamic, and family systems theories and techniques. Therapists help clients understand why they have engaged in destructive behaviors, and to look realistically at how their behavior affects their families. "Freer believes that the solution to a family's problems lies not in fixing the problem child, but rather in applying a family-systems approach based on the belief that family dynamics must change to support the change the individual undergoes or the change will not be sustainable" (Russell, 1999, p. 73). We chose CFWTE because the program is clinically very intensive and nationally recognized as a leader in the field. They are licensed by the state of Oregon, a member of the Outdoor Behavioral Healthcare Industry Council, and the only WT program in the United States to be accredited by the Joint Commission of Accreditation of Healthcare Organizations.

**Defense style.** Defense style refers to a subject's tendency, when under stress, to use: (a) *immature* (i.e., projection, passive-aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, and/or somatization); (b) *neurotic* (undoing, pseudo-altruism, idealization, and reaction formation); or (c) *mature* (i.e., sublimation, humor, anticipation, and suppression) defense styles as assessed by the Defense Style Questionnaire-40 (DSQ) (Andrews, Singh, & Bond, 1993).

**MACI.** Millon Adolescent Clinical Inventory (MACI) is a 160-item, true/false, paper and pencil self-report inventory constructed by Millon, Millon, and Davis (1993).

**Youth Outcome Questionnaire.** The Youth Outcome Questionnaire (YOQ) is a 64-item questionnaire that measures the major areas of behavior and quantifies the severity of disturbance in children or adolescents from four through 17 years of age.

**Dysfunctional personality patterns, clinical syndromes, and expressed concerns.** These are operationally defined as subject Base Rate (BR) scores<sup>2</sup> of 75 or higher on any of the MACI category scales of *Personality Patterns*, *Clinical Syndromes*, or *Expressed Concerns* (see Appendix).

**Maladaptive behaviors.** Maladaptive behaviors are defined as subject total scores of 46 or higher on the Youth Outcome Questionnaire 2.0 (YOQ) (Burlingame, Wells & Lambert, 1996).

## Methods

### Subjects

One-hundred and nine subjects (68 male, 41 female) were selected from a convenience sample of adolescents admitted to the CFWTE program between April 2000 and March 2002. All subjects were between the ages of 13 and 18 (Mean = 15.39, *SD* = 1.37). Enrollment varied from four to eight adolescents per treatment group, and not all enrollees participated so the pool of data was drawn from 23 different wilderness therapy treks. Written consent was obtained from the legal guardian(s) of all participants prior to testing. Subjects were excluded from the study if they did not successfully complete the WT program, or produced an invalid profile on either the pre or post-test MACI (CFWTE does not admit adolescents if they are actively psychotic or have an organically-based mental illness). Nine subjects were excluded from the data analysis; four who did not successfully complete the program and five who produced invalid profiles on the MACI. Invalid profiles are defined as profiles in which one of the following occurs: (a) both items from the Reliability Index are endorsed (these are items that are extremely unlikely to be endorsed such as, "I have not seen a car in over ten years;") (b) more than 10 items are left blank or double marked; (c) the Disclosure Scale is < 201 or > 589; or (d) the Desirability or Debasement Scales are > 90 (McCann, 1999).

### Research Design

CFWTE clients are adolescents who have been referred to WT because they have not responded well to more traditional treatment modalities; these adolescents are typically engaged in self-destructive behaviors and their parents are often desperately seeking help. For these

reasons, and because the treatment groups are sent to different wilderness areas at different times of the year, it was not feasible to randomly assign subjects or to use control groups in this study. Instead, we chose to use a multiple interrupted time series design.

### **Measures**

Defense styles were assessed using the Defense Style Questionnaire-40 (DSQ)—a 40-item, self-report inventory constructed by Andrews et al. (1993). Participants were asked to rate their degree of agreement with each item on a 9-point scale with 1 indicating *strong disagreement*, and 9 indicating *strong agreement*. Defense items are grouped in three Likert scales measuring: (a) immature, (b) neurotic, and (c) mature defense styles. The DSQ possesses reasonable psychometric properties (e.g., moderate internal validity and good test-retest reliability.) While it is generally acknowledged that adolescents tend to use more immature defense styles than adults (Nasserbajht, Araujo, & Steiner, 1996), Erickson, Feldman, and Steiner (1996) found that adolescent defense patterns correlate with general adjustment, and concluded that the validity of the defense mechanism paradigm can be extended to the adolescent age group.

Personality patterns, expressed concerns, and clinical syndromes were assessed by means of the MACI constructed by Millon et al. (1993). The MACI requires a 6th grade reading level, and takes 20-30 minutes to complete. It is intended for disturbed adolescents and was "normed" on 1,017 adolescents involved in outpatient, inpatient, or residential treatment programs from 28 states and Canada. The MACI has 4 response bias scales and 27 content scales separated into three clinically-relevant categories: (a) *Personality Patterns*, (b) *Expressed Concerns*, and (c) *Clinical Syndromes* (see Appendix). It is currently the most widely-used adolescent clinical inventory in the world. Four distinct norm groups have been established: (a) males 13-15 years old, (b) females 13-15 years old, (c) males 16-19 years old, and (d) females 16-19 years old.

The Personality Patterns scales (see Table A1 in Appendix for the 12 individual subscales) roughly parallel the DSM-III-R/IV personality disorders in the order of their presentation on the Millon Clinical Multiaxial Inventory-III (MCMI-III). The different personality type descriptors underscore the idea that personality is still somewhat malleable in adolescents, and personality disorders cannot be formally diagnosed. The MACI includes some personality patterns/disorders that were not included in the Millon Adolescent Personality Inventory (MAPI): Doleful, Forceful, Self-Demeaning, and Borderline Tendencies. The MACI has subsequently replaced the MAPI.

The Clinical Syndromes subscale (see Table A2 in Appendix for the 8 individual subscales) is a revision of the MAPI's Behavioral Correlates

subscale, and is intended to reflect the MACI's heightened clinical focus (Millon, 1997). On the MACI, the Expressed Concerns scales identify perceived psychosocial stressors (see Table A3 in Appendix for the 8 individual subscales).

The MACI was constructed using the Domain Theory Construction model. The Cronbach alpha reliabilities are excellent, ranging from .73 to .91, and most of the internal consistencies are greater than .80. The lack of scale specificity is the MACI's greatest weakness. The validity of the MACI was evaluated using external criteria (e.g., clinicians' ratings, and collateral instruments measuring similar constructs). "In general the pattern of correlation between MACI BR scores and the collateral self-report measures utilized in the standardization sample supports the criterion-related validity of the scales" (McCann, 1999, p. 43). Retzlaff (cited in Kramer & Conoley, 1995, p. 622) concludes that the MACI is the best test available for examining the complex relationship between environmental stressors, personality, and psychopathology in disturbed adolescents.

For an objective measure of behavior, the YOQ 2.0 (Burlingame, Wells & Lambert, 1996) was also utilized. The YOQ is completed by the child's guardian or by a staff member in a treatment facility. It takes approximately 10 minutes to complete and is written at a 5th grade level. The legal guardian(s) were asked to assess a variety of current troublesome behaviors/moods/situations with regard to their child using a Likert scale with the following options: (a) *ever or almost never present*, (b) *rarely present*, (c) *sometimes present*, (d) *frequently present*, and (e) *almost always or always present*. Because this instrument is highly face-valid, caretakers are instructed to be as accurate as possible in their responses and to avoid making their child look unrealistically healthy or unhealthy. The YOQ is broken down into six subscales—Intrapersonal Distress, Somatic, Interpersonal Relations, Critical Items, Social Problems, and Behavioral Dysfunction—and the total score reflects the adolescent's overall level of distress. The YOQ is sensitive to change over short periods of time and demonstrates high levels of reliability and validity. Internal consistency subscale estimates range from .70 to .93 and the Total Score internal consistency estimate is .96. The YOQ has demonstrated an accuracy rate of 85 percent in being able to distinguish between clinical and non-clinical subjects, and criterion validity is good as evidenced by the high correlations between the YOQ total, and subscale scores and instruments like the Child Behavior Checklist (Achenbach, 1991).

### **Procedures**

At the family meeting that takes place prior to treatment, the adolescents and their families were given a brief explanation of the proposed study. A written consent to participate was obtained from the adolescent's

legal guardian at that time. If the adolescent's guardian gave written consent, then the adolescent was asked to complete the DSQ and the MACI. Subjects could choose to *not* participate in the study by not completing either the pre or the post-tests. If subjects produced an invalid MACI profile, or did not successfully complete the CFWTE program, their data was not included in the final analysis.

Subjects completed the DSQ and the MACI before, and after, their WT experience. Parents completed the YOQ at the initial family meeting and two months after their child was discharged from treatment (YOQs were mailed to the adolescent's legal guardian 60 days after s/he had completed the program. Parents who did not return the follow-up questionnaire within two weeks were sent reminder notices). Either the primary researcher, a 37-year-old Caucasian male graduate student in a clinical psychology doctoral program at the time of this study, or a trained CFWTE staff member, administered the DSQ and the MACI to each subject on the day of the initial family meeting (admission), and once again on the night before the end family meeting (20 days into treatment and the evening prior to discharge).

### ***Data Analysis***

Data from 23 different treatment groups were included in our analysis, and the data were analyzed using the Statistical Package for the Social Sciences (SPSS). First, an initial analysis was conducted using a univariate ANOVA to determine whether or not there was any gender differences related to treatment outcomes on any of the dependent variables.

Basic descriptive statistics were then used to determine mean pre and post-test defense, personality patterns, expressed concerns, clinical syndromes, and maladaptive behavior scores and standard deviations. We calculated the number of clinical elevations that subjects had on each of the MACI categorical scales (Personality Patterns, Expressed Concerns, and Clinical Syndromes) at pre and post-test, and used paired sample *t* tests to compare the statistical differences between admission and discharge scores. Effect sizes were also calculated for immature defense scores, dysfunctional Personality Patterns scores, Expressed Concerns scores, Clinical Syndromes scores, and maladaptive behavior scores. Finally, we calculated the mean pre and post-test score, standard deviation, and effect size for each of the 27 MACI content scales (12 Personality Patterns Scales, 8 Expressed Concerns Scales, and 7 Clinical Syndromes Scales), focusing on the pre and post-test scores of individuals that had clinically elevated content scales at admission.



## Results

### *Sample Characteristics*

Of the 109 subjects included in the final analysis, 68 (62.4%) were male, and 41 (37.6%) were female. The mean age of participants was 15.39 ( $SD = 1.37$ ). See Table 4 for the most common clinically elevated (defined as BR scores > 75) Expressed Concerns, Personality Patterns, and Clinical Syndromes scales of subjects who entered the 21-day residential wilderness treatment program.

**Table 4**  
***Most Common Clinically Elevated Scales of Subjects Entering Treatment (N = 109)***

|                                | <u>MACI Scale</u>         | <u>Frequency / %</u> |
|--------------------------------|---------------------------|----------------------|
| Expressed Concerns (Axis IV)   | Family Discord            | 83 / 76%             |
|                                | Social Insensitivity      | 32 / 29%             |
|                                | Identity Diffusion        | 20 / 18%             |
| Personality Patterns (Axis II) | Unruly (Antisocial)       | 55 / 50%             |
|                                | Oppositional              | 38 / 35%             |
|                                | Dramatizing (Histrionic)  | 25 / 23%             |
|                                | Borderline Tendency       | 25 / 23%             |
| Clinical Syndromes (Axis I)    | Substance Abuse Proneness | 50 / 46%             |
|                                | Delinquent Predisposition | 50 / 46%             |
|                                | Impulsive Propensity      | 43 / 39%             |
|                                | Depressive Affect         | 41 / 38%             |

As can be seen from the data in Table 5, eighty-seven subjects (79.8%) had at least one clinically elevated Personality Pattern scale and at least one elevated Clinical Syndrome scale at pre-test; 92 subjects (84.4%) had at least one clinically elevated Expressed Concerns scale; and 107 subjects (98.2%) had clinically elevated maladaptive behavior total scores as measured by the YOQ. Table 5 also breaks down the number of

**Table 5**  
**# Ss with Clinically Elevated MACI Scales at Pre-test and Mean Number of Categorical Elevations**

|                                  | Frequency / % | Mean No. of CE Subscales | SD   |
|----------------------------------|---------------|--------------------------|------|
| MACI Expressed Concerns Scales   | 92 / 84.4%    | 1.68                     | 1.25 |
| MACI Clinical Syndromes Scales   | 87 / 79.8%    | 1.95                     | 1.47 |
| MACI Personality Patterns Scales | 87 / 79.8%    | 2.17                     | 1.68 |

clinically elevated MACI content scales that subjects had at pre-test for Axes I, II, and IV. Subjects entering the WT program had a mean number of 1.68 clinically elevated expressed concerns scales ( $SD = 1.25$ ), 1.95 clinically elevated clinical syndromes scales ( $SD = 1.47$ ), and 2.17 clinically elevated dysfunctional personality patterns scales ( $SD = 1.68$ ). The mean maladaptive behavior pre-test score, as assessed by parents and measured by the YOQ, was 96.92 ( $SD = 25.118$ ), indicating that subjects entered WT with dysfunction scores comparable to those of adolescents who are admitted to psychiatric hospitals (Burlingame et al., 1996).

### **Gender Differences**

An initial analysis was conducted using a univariate ANOVA to determine whether or not there was any gender differences related to treatment outcomes (pre and post-test immature defense, dysfunctional personality patterns, clinical syndromes, and maladaptive behavior scores were examined). Only post-test dysfunctional personality patterns scores showed a significant gender difference ( $F(1, 107) = 6.67, p < .05$ ) so we chose not to investigate the gender variable.

We predicted that WT would have a positive effect on the post-test immature defense, expressed concerns, dysfunctional personality patterns, clinical syndromes, and maladaptive behavior scores of subjects. See Tables 6 and 7 for a breakdown of pre and post-treatment test results.

The effects of WT were evaluated using paired samples  $t$  tests to compare pre and post-test defense, dysfunctional Personality Patterns, Expressed Concerns, Clinical Syndromes, and maladaptive behavior scores. Because we examined multiple Personality Patterns, Clinical Syndromes, and Expressed Concerns, we initially compared the number of clinically elevated MACI subscales for these at pre and post-test. For maladaptive behaviors, pre and post-test YOQ total scores were used. As

expected, WT was found to have positive significant effects on the immature defense scores ( $t(108) = 3.71, p < .01$ ); dysfunctional personality patterns scores ( $t(108) = 2.07, p < .05$ ); expressed concerns scores ( $t(108) = 2.65, p < .01$ ); clinical syndromes scores ( $t(108) = 3.66, p < .01$ ); and maladaptive behaviors scores ( $t(44) = 6.20, p < .01$ ) of troubled adolescents. Effect sizes were also calculated for each of the dependent variables. WT had a small effect on dysfunctional personality patterns (Cohen's  $d = .40$ ), a moderate effect on immature defense scores (Cohen's  $d = .75$ ), expressed concerns scores (Cohen's  $d = .51$ ), and clinical syndromes scores (Cohen's  $d = .70$ ), and a large effect on maladaptive behavior scores (Cohen's  $d = 1.87$ ). Wilderness therapy was found to significantly increase neurotic defense scores ( $t(99) = -2.97, p < .01$ ), and the effect was moderate in size (Cohen's  $d = -0.60$ ). Although this finding is somewhat surprising, it may not be a negative outcome per se in that neurotic defenses are more adaptive and functional than the immature defenses typically associated with character pathology.

**Table 6**  
**Pre and Post-Test Results**

|   | Pre           | Post         |
|---|---------------|--------------|
| Mature Defense Style  | 54.1%         | 60.6%        |
| Neurotic Defense Style  | 22.9%         | 17.4%        |
| Immature Defense Style  | 17.4%         | 5.5%         |
| Psychosocial Stressors (EC)   | $M = 1.68$    | $M = 1.30$   |
| (# of Clinical MACI Expressed<br>Concerns Scales, Axis IV,<br>clinical elevation = BR > 75) | $SD = 1.25$   | $SD = 1.04$  |
| Dysfunctional Personality Patterns (DPP)  | $M = 2.17$    | $M = 1.79$   |
| (# of Clinical MACI PP Scales, Axis II,   | $SD = 1.68$   | $SD = 1.47$  |
| Clinical Syndromes (CS)   | $M = 1.95$    | $M = 1.39$   |
| (# of Clinical MACI CS Scales, Axis I,<br>clinical elevation = BR > 75)                     | $SD = 1.47$   | $SD = 1.26$  |
| Maladaptive Behavior Scores (MB)  | $M = 96.92$   | $M = 53.44$  |
| (YOQ total score, clinical cut-off = 46)  | $SD = 25.118$ | $SD = 29.98$ |

**Table 7**  
**The Effects of Wilderness Therapy — Paired Samples Test (N = 109)**

| Pre and Post      | Mean Pre/SD   | Mean Post/SD | t     | df  | Sig. (2-tailed) | Cohen d      |
|-------------------|---------------|--------------|-------|-----|-----------------|--------------|
| Mature D Scores   | 5.17 / 1.13   | 5.31 / 1.05  | -1.24 | 99  | .22 (no)        | -.02 (none)  |
| Neurotic D Scores | 4.37 / 1.37   | 4.68 / 1.19  | -2.97 | 99  | .01 (yes)**     | -.60 (mod.)  |
| Immature D Scores | 4.34 / .94    | 3.98 / 1.02  | 3.71  | 108 | .001 (yes)**    | .75 (mod.)   |
| DPP Scores        | 2.17 / 1.68   | 1.79 / 1.47  | 2.07  | 108 | .04 (yes)*      | .40 (small)  |
| CS Scores         | 1.95 / 1.47   | 1.39 / 1.26  | 3.66  | 108 | .001 (yes)**    | .70 (mod.)   |
| EC Scores         | 1.68 / 1.25   | 1.30 / 1.04  | 2.65  | 108 | .01 (yes)**     | .51 (mod.)   |
| MB Scores         | 96.92 / 25.12 | 53.44 / 29.9 | 6.20  | 44  | .001 (yes)**    | 1.87 (large) |

Note. \*\*Correlation is significant at the .01 level (2-tailed).

\*Correlation is significant at the .05 level (2-tailed).

Changes in mean pre and post-test scores were then compared for each of the MACI Personality Patterns, Clinical Syndromes, and Expressed Concerns scales on which subjects had clinically elevated pre-test scores, and calculated effect sizes (see Appendix).

The effect sizes of WT were impressive, particularly considering the short-term nature of the treatment program (21 days). We found statistically significant effects on all of the dysfunctional personality patterns and clinical syndromes scales, and on all of the expressed concerns scales for which there was a sufficient sample size. Large effects were found for 10 out of 12 Personality Patterns scales (see Appendix, Table A1), a moderate effect was found for unruly/antisocial Personality Patterns (Cohen's  $d = .77$ ), and a small effect was found for dramatizing/histrionic Personality Patterns (Cohen's  $d = .48$ ). Large effects were found for 5 out of 7 Clinical Syndromes scales (eating dysfunctions, impulsive propensity, anxious feelings, depressive affect, and suicidal tendency); and moderate effects were found for substance abuse proneness (Cohen's  $d = .73$ ); and delinquent predisposition (Cohen's  $d = .76$ ). Large effects were found for all of the Expressed Concerns scales (see Appendix A3) for which we had more than one subject with a clinically elevated pre-test scale score.

The mean effect size of wilderness therapy was large for all three clinical domains (Cohen's  $d = 1.22$  for dysfunctional Personality Patterns (Axis II), 1.68 for Clinical Syndromes (Axis I), and 1.39 for Expressed Concerns (Axis IV)).

## Discussion

Our hypothesis predicted that WT would have a positive effect on the post-test immature defense, expressed concerns, dysfunctional personality patterns, clinical syndromes, and maladaptive behavior scores of subjects. The data strongly support this hypothesis. WT resulted in statistically significant improvement on immature defense and maladaptive behavior scores, and on dysfunctional personality patterns, expressed concerns, and clinical syndromes scores. WT had a large effect size on maladaptive behaviors and treatment effects, at least as measured by the YOQ, and were similar to those found by Russell (2001) in an outcome study that included 858 subjects admitted for treatment at eight participating WT programs.

Although the effect size of WT on the number of clinically elevated Personality Patterns scales was small, WT had a large effect on subjects with dysfunctional personality patterns for 10 of the 12 MACI Personality Patterns scales (See Appendix A1). A moderate effect size was found for Unruly/Antisocial Personality Patterns, and a small effect was found for Dramatizing/Histrionic Personality Patterns. There was also a large mean

effect size for the types of cluster-B personalities<sup>3</sup> (Dramatizing/Histrionic, Egotistic/Narcissistic, Unruly/Antisocial, Forceful/Sadistic, Oppositional, and Borderline) that so often come to the attention of our mental health and legal systems. These findings are particularly significant since short-term interventions resulting in positive character change are almost unheard of in the personality literature. While wilderness adventure pioneers Kurt Hahn and David Baden-Powell both noticed that physically and emotionally demanding outdoor experiences were effective in bringing about positive character change, this is one of the few wilderness therapy studies that has looked at personality as a dependent variable (see also Marsh, Richards & Barnes, 1986; Marsh & Richards, 1989), and the only one that has looked at WT as a possible short-term treatment for budding personality disorders.

Statistically significant effects were found for all the Clinical Syndromes scales (see Appendix A2) on which subjects had elevated pre-test scores. Significant effects were also found for all the Expressed Concerns scales for which we had a sufficient sample size (see Appendix A3). Large effect sizes were found for the following clinical syndromes: Eating Dysfunctions, Impulsive Propensity, Anxious Feelings, Depressive Affect, and Suicidal Tendency, and moderate effects were found for Substance Abuse Proneness and Delinquent Predisposition. Regarding expressed concerns, large effects were found for Identity Diffusion, Self-Devaluation, Body Disapproval, Sexual Discomfort, Social Insensitivity, Family Discord, and Childhood Abuse.

While no generalizations can be made due to the quasi-empirical design of this study, the findings are robust and suggest that this WT program demonstrated considerable breadth as a treatment modality and, again, treatment effects were similar to those found by Russell (2001) in the largest WT outcome study completed to date. This study also lends additional empirical evidence for the efficacy of WT for adolescents with clinical concerns on Axes I, II, and IV.

### **Limitations of this Study**

There are several potential sources of error or bias in this study. No comparison group was utilized for two reasons: (a) due to the prohibitive cost of establishing a control group for a private treatment program, and (b) because adolescents in WT programs are typically involved in self-destructive behaviors, have not responded to traditional treatment modalities, and their parents are desperately seeking help and see WT as their last hope.

Another potential limitation of this study was that the analysis of Expressed Concerns, dysfunctional Personality Patterns, and Clinical

Syndromes focused on outcomes for subjects who had clinically elevated pre-test scores on any of those MACI subscales. Future research on these variables should also look at those subjects who may have been negatively affected by WT (e.g., subjects that do not have clinically elevated pre-test scores but do have clinically elevated post-test scores).

Since all subjects admitted to CFWTE between April 2000 and March 2002 were asked to participate in the study, potential bias in results would occur if parents/clients *not* agreeing to participate in this study were somehow consistently different from those who *did* agree to participate. The reason cited most often by parent-child units choosing not to participate was concerns about confidentiality. No data were gathered with which to compare non-participants to participants.

Because we sought to look at the effects of WT on troubled adolescents from such a holistic perspective, the sheer number of dependent variables examined could have potentially confounded our results. However, the breadth and robustness of our findings, in light of the numerous dependent variables examined, provides further support for the hypothesis, and actually turns a potential weakness of this study into a strength. Furthermore, as mentioned, a secondary goal of this research project was to begin to identify the types of psychosocial stressors, and Axes I and II disorders, for which WT is most effective so that future studies can use research designs that are more methodologically sound to investigate promising dependent variables such as budding personality disorders.

Finally, a word of caution is in order. While the findings support the effectiveness of WT for a wide range of adolescent clinical concerns on Axes I, II, and IV, it would be unwise to generalize our findings to all WT programs, particularly those that are not licensed by state agencies.

### **Future Research**

With a growing body of empirical evidence supporting the effectiveness of WT for a number of psychosocial concerns, and Axes I and II disorders, it is critical that future studies include control groups and randomly assign subjects. Findings suggest that WT may be effective for behavioral, mood, substance abuse, eating, anxiety, and impulse-control disorders, and for the type of identity confusion, low self-esteem, and family dysfunction that so many troubled adolescents struggle with. The most striking finding, however, is that WT may be effective in facilitating positive characterological change, and in treating character pathology. This is significant for two reasons. First, short-term interventions leading to character change are almost unheard of in the personality literature. Second, personality disorders take a huge emotional and financial toll on individuals, families and society, and they are notoriously difficult to treat.

Because this particular WT appeared to have such broad and robust effects across a wide variety of clinical concerns on Axes I, II, and IV (in this study), we recommend that future researchers use measures that are multi-dimensional and psychometrically-sound, such as the MACI.

Finally, the authors recommend that future research examining the effects of WT on Axes I and II disorders include follow-up data (preferably at one and three-year intervals) so that more light may be shed on the long-term effects of WT. The biggest gap in the research continues to be the lack of longitudinal studies. Longitudinal research will be especially important for determining whether or not WT is effective for treating budding personality disorders.

## References

- Achenbach, T. (1991). *Manual for the Child Behavior Checklist and 1991 Profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- American Psychiatric Association (1994). *The diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.
- Andrews, G., Singh, M., & Bond, M. (1993). The defense style questionnaire. *Journal of Nervous and Mental Disease*, 181(4), 246-256.
- Bacon, S., & Kimball, R. (1989). The wilderness challenge model. In R. Lyman, S. Prentice-Dunn, & S. Gabel (Eds.), *Residential and inpatient treatment of children and adolescents* (pp. 115-144). New York: Plenum Press.
- Burlingame, G., Wells, M., & Lambert, M. (1996). *The Youth Outcome Questionnaire* (2nd ed.). Wharton, NJ: American Professional Counseling Services.
- Burlingame, G., Wells, M., Hoag, M., Hope, C., Nebeker, R., Konkel, K., et al. (1996). *Manual for youth outcome questionnaire*. Stevenson, MD: American Professional Credentialing Services.
- Daley, S., Burge, D., & Hammen, C. (2000). Borderline personality disorder symptoms as predictors of 4-year romantic relationship dysfunction in young women: Addressing issues of specificity. *Journal of Abnormal Psychology*, 109(3), 451-460.
- Erickson, S., Feldman, S., & Steiner, H. (1996). Defense mechanisms and adjustment in normal adolescents. *American Journal of Psychiatry*, 15(6), 826-828.
- Gillis, H., & Simpson, C. (1991). Project Choices: Adventure-based residential drug treatment for court-referred youth. *Journal of Addictions and Offender Counseling*, 12(1), 12-27.
- Hanna, R. (1996). *Process of change and adaptation of adolescent wilderness therapy graduates: A qualitative analysis*. Unpublished doctoral dissertation, Brigham Young University, Provo, UT.



- Kramer, J., & Conoley, J., (Eds.). (1995). *The twelfth mental measurements yearbook*. Lincoln, NE: Buros Institute of Mental Measurements, University of Nebraska Press.
- Marsh, H. & Richards, G. (1989). A test of bipolar and androgyny perspectives of masculinity and femininity: The effect of participation in an Outward Bound program. *Journal of Personality, 57*(1), 115-137.
- Marsh, H., Richards, G., & Barnes, J. (1986). Multidimensional self-concepts: A long-term follow-up of the effect of participation in an Outward Bound Program. *Personality and Social Psychology Bulletin, 12*(4), 475-492.
- McCann, J. (1999). *Assessing adolescents with the MACI: Using the Millon Adolescent Clinical Inventory*. New York: John Wiley & Sons.
- Millon, T. (1996). *Disorders of personality: DSM-IV and beyond*. New York: John Wiley & Sons.
- Millon, T. (1997). *The Millon Inventories: Clinical and personality assessment*. New York: Guilford Press.
- Millon, T., Millon, C., & Davis, R. (1993). *The Millon Adolescent Clinical Inventory*. Minneapolis, MN: NCS Assessments.
- Nasserbahjt, A., Araujo, K., & Steiner, H. (1996). A comparison of adolescent and adult defense styles. *Child Psychiatry and Human Development, 27*(1), 3-13.
- Porter, W. (1975). *The development and evaluation of a therapeutic wilderness program for youth*. Unpublished master's thesis, University of Denver, CO.
- Russell, K. (1999). *Theoretical basis, and reported outcomes of wilderness therapy as an intervention and treatment for problem behavior in adolescents*. Unpublished doctoral dissertation, University of Idaho, Moscow.
- Russell, K. (2001). *Assessment of treatment outcomes in outdoor behavioral healthcare*. 1-38. Retrieved from <http://www.its.uidaho.edu/wrc/Research/publicat.htm>
- Russell, K., & Hendee, J. (1999). *Wilderness therapy as an intervention and treatment for adolescents with behavioral problems* (pp. 1-24). Retrieved from <http://www.its.uidaho.edu/wrc/Research/publicat.htm>
- Willis, S. (1989). *Wilderness therapy: The search for healing, health, and wholeness in the wilderness*. Unpublished doctoral dissertation, Fuller Theological Seminary, Pasadena, CA.

## Footnotes

<sup>1</sup>The Diagnostic and Statistical Manual of Mental Disorders (4th ed.) uses a multi-axial diagnostic system (American Psychiatric Association, 1994). Axis I is used to code clinical disorders, Axis II for personality disorders, Axis III for medical conditions, Axis IV for psychosocial problems, and Axis V for overall functioning.

<sup>2</sup>BR-scores differ from *t* scores in that they are based on the assumption that personality disturbances and clinical syndromes are not evenly distributed disturbances and clinical syndromes are not evenly distributed in the general population. BR-scores, then, reflect the presence or absence of a particular expressed concern, personality pattern, or clinical syndrome and its relative level of severity.

<sup>3</sup>Cluster B personalities in the DSM-IV-R include Antisocial Personality Disorder, Borderline Personality Disorder, Histrionic Personality Disorder, and Narcissistic Personality Disorder.

## Appendix

**Table A1**  
**Mean Pre and Post-Test Scores and Effect Sizes for Subjects with**  
**Clinically Elevated Pre-test Scores**

*MACI Personality Patterns Scores*

|                            | <i>N</i> | <i>Mean Pre / SD</i> | <i>Mean Post / SD</i> | <i>Cohen's d</i> |
|----------------------------|----------|----------------------|-----------------------|------------------|
| Introversive/Schizoid      | 7        | 87.14 / 10.79        | 61.43 / 18.77         | 1.68 (large)     |
| Inhibited/Avoidant         | 10       | 83.70 / 5.38         | 71.30 / 19.26         | 0.88 (large)     |
| Doleful/Depressive         | 22       | 82.82 / 5.12         | 57.82 / 27.02         | 1.29 (large)     |
| Submissive/Dependent       | 3        | 86.33 / 5.50         | 73.00 / 8.88          | 1.80 (large)     |
| Dramatizing/Histrionic     | 25       | 86.64 / 8.46         | 80.68 / 15.21         | 0.48 (small)     |
| Egocentric/Narcissistic    | 10       | 82.00 / 6.07         | 71.20 / 15.39         | 0.92 (large)     |
| Unruly/Antisocial          | 55       | 89.78 / 10.55        | 78.82 / 17.22         | 0.77 (mod.)      |
| Forceful/Sadistic          | 18       | 83.28 / 7.06         | 63.72 / 21.12         | 1.24 (large)     |
| Conforming/Compulsive      | 6        | 82.50 / 10.04        | 66.33 / 11.86         | 1.47 (large)     |
| Oppositional               | 38       | 83.55 / 8.40         | 64.76 / 19.01         | 1.28 (large)     |
| Self-Demeaning/Masochistic | 17       | 81.41 / 5.34         | 60.82 / 23.28         | 1.22 (large)     |
| Borderline Tendency        | 25       | 85.00 / 9.023        | 54.20 / 25.86         | 1.59 (large)     |

**Table A2**  
**MACI Clinical Syndromes Scores**

|                           | <u>N</u> | <u>Mean Pre / SD</u> | <u>Mean Post / SD</u> | <u>Cohen's d</u> |
|---------------------------|----------|----------------------|-----------------------|------------------|
| Eating Dysfunctions       | 4        | 90.00 / 14.98        | 28.75 / 11.442        | 4.40 (large)     |
| Substance Abuse Proneness | 50       | 94.28 / 13.57        | 80.12 / 24.02         | 0.73 (mod.)      |
| Delinquent Predisposition | 50       | 89.48 / 10.23        | 78.90 / 16.69         | 0.76 (mod.)      |
| Impulsive Propensity      | 43       | 85.65 / 9.65         | 65.07 / 25.84         | 1.05 (large)     |
| Anxious Feelings          | 7        | 82.29 / 6.50         | 61.29 / 17.92         | 1.56 (large)     |
| Depressive Affect         | 41       | 87.61 / 9.41         | 66.56 / 23.07         | 1.19 (large)     |
| Suicidal Tendency         | 18       | 85.78 / 9.58         | 49.22 / 23.09         | 2.07 (large)     |

**Table A3**  
**MACI Expressed Concerns Scores**

|                      | <u>N</u> | <u>Mean Pre / SD</u> | <u>Mean Post / SD</u> | <u>Cohen's d</u> |
|----------------------|----------|----------------------|-----------------------|------------------|
| Identity Diffusion   | 20       | 86.00 / 12.11        | 47.50 / 19.81         | 2.34 (large)     |
| Self-Devaluation     | 18       | 85.78 / 10.00        | 64.89 / 26.52         | 1.53 (large)     |
| Body Disapproval     | 7        | 95.86 / 10.90        | 73.86 / 24.44         | 1.16 (large)     |
| Sexual Discomfort    | 1        | 77.00 / *            | 57.00 / *             | *                |
| Peer Insecurity      | 12       | 83.42 / 9.32         | 62.92 / 20.76         | 1.27 (large)     |
| Social Insensitivity | 32       | 83.56 / 8.76         | 70.38 / 14.82         | 1.08 (large)     |
| Family Discord       | 83       | 89.34 / 8.83         | 77.41 / 14.93         | 0.97 (large)     |
| Childhood Abuse      | 10       | 81.30 / 8.78         | 56.10 / 24.86         | 1.35 (large)     |

Note. \*N was too small to calculate SD or effect size.

Copyright of Journal of Experiential Education is the property of Association for Experiential Education and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.