

# *Experiential Learning in Psychotherapy: Ropes Course Exposures as an Adjunct to Inpatient Treatment*

Markus Wolf<sup>1,\*</sup> and Kilian Mehl<sup>2</sup>

<sup>1</sup>Center for Psychotherapy Research, University Hospital Heidelberg, Germany

<sup>2</sup>Klinik Wollmarshoehe, Private Hospital for Psychosomatic and Internal Medicine, and Neuropsychology, Germany

Exposures to a high-ropes course are introduced as an adjunct intervention in the therapy of psychotherapy patients. A controlled study was conducted to investigate the effectiveness of high-ropes exposures as an add-on to inpatient treatment in a naturalistic setting. In a sample of 247 patients, depressive symptoms, trait anxiety, locus of control and self-efficacy were assessed at admission and discharge of treatment and at 24-month follow-up. Follow-up data were available for 104 patients who attended the ropes courses and 53 control patients who underwent an inpatient treatment programme as usual. At the end of treatment, more high-rope participants showed clinically significant change on trait anxiety than controls but not regarding depressive symptoms. High-rope participants showed better follow-up outcomes than controls in trait anxiety and self-efficacy but not in depressive symptoms and external locus of control. Moreover, during follow-up, in the high-rope group, more patients showed reliable improvements and fewer patients showed reliable deteriorations in trait anxiety as compared with controls. The study gives a preliminary indication that the high-rope interventions are a feasible and valuable add-on to inpatient psychotherapy. The study design, sample composition and loss to follow-up are discussed as potential limitations of the study. Copyright © 2010 John Wiley & Sons, Ltd.

## **Key Practitioner Message:**

- Based on the principles of experiential learning, outdoor ropes courses are a means for the facilitation of personal growth and promotion of individual coping skills.
- A ropes course intervention was evaluated as an add-on to a psychotherapy inpatient programme.
- In a diagnostically mixed inpatient sample, participation in ropes course exposures seemed to be related with better long-term outcomes on personality variables—trait anxiety and self-efficacy—but not regarding depressive symptoms and state anxiety.

---

\*Correspondence to: Markus Wolf, Center for Psychotherapy Research, University Hospital Heidelberg, Bergheimer Str. 54, 69115 Heidelberg, Germany.  
E-mail: markus.wolf@med-uni-heidelberg.de

- Interventions that draw upon experience and group action might be a valuable addition to talking psychotherapy.

**Keywords:** Experiential Learning, Ropes Course, Psycho-physical Exposure, Inpatient Psychotherapy, Trait Anxiety, Locus of Control

## INTRODUCTION

Experiential education and outdoor adventure activities have enjoyed increasing popularity since the foundation of Outward Bound in the USA by the pedagogue and educator Kurt Hahn in the early 1960s (Hahn, 1957). In the prevention, treatment and rehabilitation of adolescent delinquency, Outward Bound and similar programmes, including challenge (rope) courses, have been comprehensively applied and evaluated (Wilson & Lipsey, 2000). In these domains, experiential learning techniques are often referred to as outdoor education, wilderness challenge programmes, wilderness therapy or adventure therapy. One consistent finding of this research is that outdoor education programmes increase psychological adaptation of the participants (Hans, 2000; Hattie, Marsh, Neill, & Richards, 1997). Moreover, research shows that outdoor programmes are effective in reducing clinical symptoms, such as trait anxiety and negative affect, although follow-up data indicate that these effects fade over time (Ewert, 1988; Fry & Heubeck, 1998).

In sum, beneficial therapeutic effects have been reported for clinical and non-clinical samples on outcome variables, such as physical fitness, interpersonal and family functioning, group performance, social skills, self-esteem, internal locus of control (LOC), self-efficacy and psychological symptoms, such as depression or anxiety. Meta-analyses indicate that the effects of challenge programmes on these outcome criteria are reliable and amount to small to medium effect sizes (Cason & Gillis, 1994; Gillis & Speelman, 2008; Hans, 2000; Hattie et al., 1997; Wilson & Lipsey, 2000).

Recently, Gillis and Speelman (2008) reviewed evaluation studies that specifically focus on ropes courses. In their meta-analysis, they examined 44 studies covering a total sample size of  $N = 2796$  individuals. Only controlled studies were included, in which control groups either received no challenge course, were on a waiting list or received alternative programming. Overall, the authors found an average effect size of 0.43, leading them to the conclusion that 'challenge courses are an effective tool for impacting a variety of educational and psy-

chological constructs with a variety of participants' (Gillis & Speelman, 2008, p. 127). It was also shown that studies that had a therapeutic focus—as compared with educational and developmental purposes—showed the largest effect sizes.

However, generalizability of the existing empirical literature to clinical conditions is limited. In most previous research, outdoor challenge programmes, such as Outward Bound, are characterized by a broad range of interventions and adventure experiences, including rope courses, rock climbing, white water canoeing, mountaineering and backpacking. Also, while a typical Outward Bound experience lasts about 20 days (Hattie et al., 1997), in clinical settings, the activities have to be more time limited and structured. Finally, most recent studies had an educational, or developmental, but not a clinical focus and used high school or university-age participants (Conley, Caldarella, & Young, 2007).

### *Ropes Course Interventions in Psychotherapy*

Despite the growing popularity of experiential interventions and evidence regarding their effectiveness in the aforementioned domains, their potentials have not been fully recognized in clinical psychology and adult psychotherapy. Put simply, experiential learning is learning by doing with intense reflection, i.e., learning and personal development are achieved through individually determined experiences and psycho-physical involvement. According to Kolb (1984), who borrowed basic concepts from Kurt Lewin's action research, the principles of experiential learning hold that learning is a holistic, continuous process grounded in experience. Learning requires the resolution of conflicts between opposed modes of adaptation to the world and involves transactions between the person and the environment. Outdoor and ropes courses offer an opportunity to induce strong and vivid experiences and facilitate change through challenge ('unfreezing' in Lewin's three-phase model of change); they have been increasingly used to facilitate personal growth in healthy individuals based on the principles of experiential learning.

Attempts have been undertaken to transfer these principles to the treatment of individuals with mental disorders by integrating physical challenges and real-life experiences into mental health treatment programmes (Gass, 1993). According to clinical reports, Outward Bound and similar programmes were successfully used as adjunct treatments for hospitalized psychiatric patients (Berman & Anton, 1988; Eickenaes, Gude, & Hoffart, 2006; Stich & Senior, 1984), for individuals who were treated for drug abuse (Gass & McPhee, 1990), or in adolescents' outpatient treatment (Davis-Berman & Berman, 1989). One empirical study has investigated ropes courses as an alternative treatment for emotionally disturbed, hospitalized adolescents and found only few effects on different mood dimensions (Voight, 1988), but the results must be considered preliminary due to the small sample size.

The psychological processes initiated by challenge programmes have high relevance for psychotherapy. Low self-efficacy, negative control expectancies or generalized external control beliefs are linked to an individual's susceptibility to stress and are considered risk factors for the development of a mental disorder (e.g., Bandura, 1997). More specifically, these variables are linked to the vulnerability for depression (Presson & Benassi, 1996). From a coping skills perspective, a self-concept based on high self-efficacy and internal control expectancies is considered a significant personal resource that should be fostered by psychotherapeutic interventions (Grawe, 2004). Moreover, the initiation of therapeutic group processes are a crucial part of outdoor challenge programmes, such as the experience of social support or the development of interpersonal skills, cohesion and a trusting relationship with the group. Thus, therapist-guided ropes courses in a structured environment offer a promising means to enhance psychotherapy.

In the present study, we introduce a ropes course intervention as an add-on to inpatient psychotherapy in a specialized hospital for psychosomatic and internal medicine. The high-rope was built in the early 1990s and is located outdoors, adjacent to the hospital buildings. Since this time, the ropes course has been continuously used in the treatment programme and in non-clinical team building activities. The construction consists of a swinging wooden frame, approximately 12 m high. Rope courses are created from 12 different elements, such as wires, polyamide ropes, static and moving ropes and wooden beams. There are two platforms

with cross ropes at heights of 5 and 10 m. The construction offers various options for low- and high-challenge courses (see Priest & Gass, 2005).

In late 2003, we piloted a project that aimed to investigate the acceptability of the hospital's ropes courses and to evaluate their effectiveness. The study was conducted under routine conditions in a diagnostically mixed, consecutive sample of psychotherapy inpatients. In an earlier report, we found that a large proportion of patients were utilizing this intervention during their inpatient programme. Moreover, the acceptability of the ropes courses was high, and participants showed larger pre-post changes on the outcome criteria—self-rated symptoms of depression and anxiety, self-efficacy and LOC—as compared with patients of the control group who did not participate in the exposures during their inpatient treatment (Mehl & Wolf, 2008). The aims of the present study are to report the results of a 24-month follow-up and further investigate the clinical significance of the results achieved during the inpatient treatment phase as well as until follow-up. The primary outcome variables of this study were depressive symptoms, trait anxiety, self-efficacy and LOC. As secondary outcomes, the patients' work ability, number of sick days and service utilization during the follow-up were assessed.

## METHOD

### *Study Design and Procedure*

The high-rope evaluation study is a prospective naturalistic study with a non-equivalent control group design. Sample size considerations were based on the assumptions that the high-rope intervention would enhance treatment outcome to the amount of a medium effect size according to Cohen (1988). Sample size calculations indicate that a total of  $N = 200$  patients would be adequate to identify a medium effect size ( $d \geq 0.50$ ) using an alpha of 0.0125 (two sided; Bonferroni adjusted for four primary outcomes) and a statistical power of 80%. Hence, we planned to continue consecutive recruitments until approximately 100 patients were enrolled in each of the two conditions.

Participation in the study and in the ropes course exposures was voluntary. Over a 16-month recruitment period, every newly admitted patient was informed about the project, asked for participation and, given that written consent was provided, enrolled in the study at the beginning of her or his treatment. The selection for patient

participation in the ropes courses depended on the patient's psychological and physical conditions, as well as personal indications as assessed by individual therapists during the first weeks of treatment. Patients were always free to decline from the therapist's invitation without any consequences regarding their further treatment. Although a high-ropes course can be physically demanding, no strict exclusion criteria were defined regarding age or a patient's general physical condition. For example, the presence of a neurological disorder, such as multiple sclerosis or Parkinson's disease, was not an exclusion criterion. Patients who were enrolled in the study but who did not attend the rope courses during their inpatient stay were assigned *post hoc* to the control group. Psychological assessments were carried out at admission and discharge and at follow-up 24 months after discharge from the hospital. All patients who had participated in the study were sent a follow-up questionnaire. In the case that a patient had not sent back the follow-up questionnaire, two reminder letters were sent by post within the following 4 weeks.

Of the 296 patients who were newly admitted to the hospital in the recruitment period, 247 patients were enrolled into the project. Three patients were excluded because they showed too severe pathology (e.g., acute psychotic symptoms), 9 missed the initial assessment and 37 did not give their informed consent. Of the 247 patients, 155 patients attended one or more rope sessions and thus were in the intervention group, while 92 patients who did not participate in the rope exposures were assigned to the control group. One hundred fifty seven patients (64%) responded to the follow-up questionnaire. The final completer sample consisted of 104 rope course participants and 53 patients in the control group (see Figure 1).

### Participants

The following sample description refers to the completer sample ( $N = 157$ ) that was used in the present study (Table 1). Sixty-four per cent of the patients were female, and their mean age was 51.0 years (standard deviation [SD] = 9.2). Most patients were married (58%) and had a high level of education (75%, German 'Abitur'). About half of the patients were diagnosed with a mood disorder (52%) or a neurotic, stress-related and somatoform disorder (42%). On average, the patients were treated for 51.0 days (SD = 23.9) in the hospital inpatient programme.

### Treatment

All patients underwent regular inpatient treatment in the specialized hospital for psychosomatic and internal medicine. As usual in German psychosomatic inpatient treatment, the treatment followed an interdisciplinary approach combining psychotherapy, internal medicine and complementary medicine. Weekly individual and group psychotherapeutic interventions drew on principles of behavioural medicine, cognitive behavioural therapy, systemic therapy and brief psychodynamic therapy and were provided by experienced therapists with either psychological or psychosomatic training background.

As an add-on to their individual treatment programme, patients in the high-rope condition participated in at least one ropes course session during their stay. The first ropes session was scheduled when the patient's acute crisis had been attenuated. A typical ropes session lasted 3 hours from preparation until post-exposure group evaluation. Ideally, two sessions were scheduled within two consecutive weeks in order to capitalize on the full range of exercises. Patients were given the opportunity, however, to participate less or more often depending on their individual treatment condition.

Rather than being an isolated exposure technique, the ropes exposures were integrated into the individual treatment plan, i.e., they were linked to an individual's presenting problems and change goals. Following the principles of experiential learning and action control theory (Heckhausen, 1991), the ropes course intervention can conceptually be divided into five phases:

(1) Motivational phase: Early in treatment, regular individual therapy sessions are dedicated to raise problem awareness and define individual treatment goals that might later be targeted in the exposures. (2) Volitional phase: An individual work model for the exposures is established, and the patient's readiness to change is further reinforced in individual sessions. Virtual experiential scenarios that the patient might be confronted with on the rope are discussed. Potential experiences that the patient will make on the rope are connected to his or her individual problems and change goals. In this phase, a colloquial or metaphoric language is often used to label these goals (see Gass, 1991), for instance, 'take a first step', 'establish a stable relationship', 'cope with fears', 'learn to let go' or 'face a challenge'. By tailoring the ropes challenge to the patient's individual problems, it is aimed at

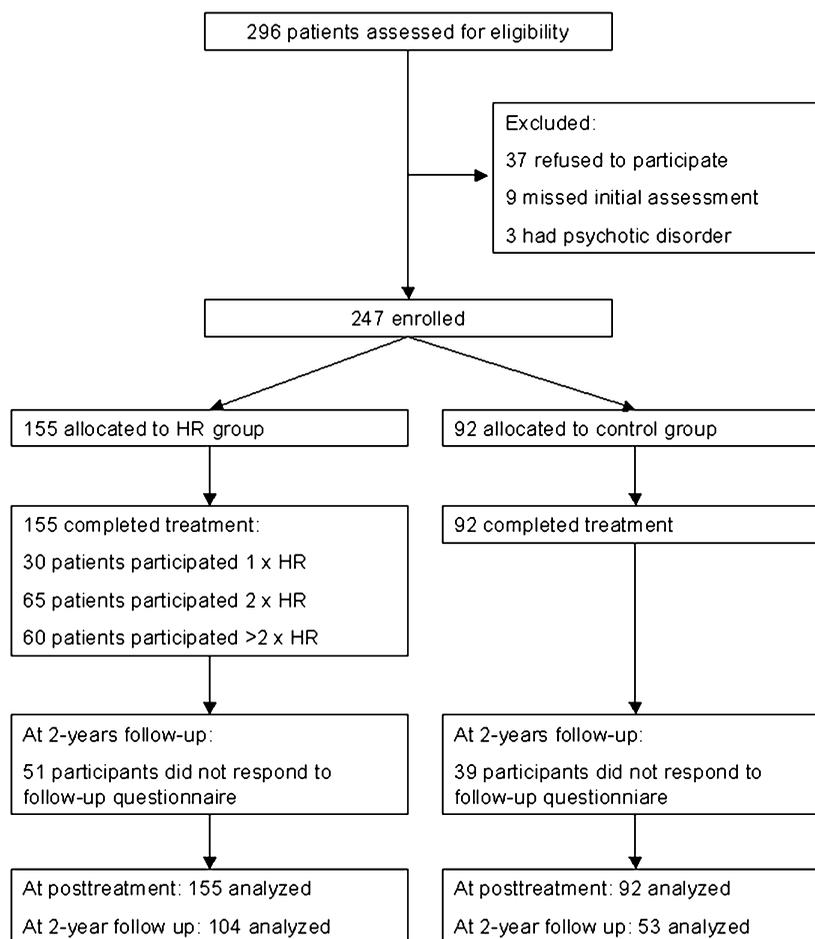


Figure 1. Participant flow. HR = high-rope

providing the patient with a structured learning environment for confronting dysfunctional beliefs, re-learning and making corrective experiences. (3) Action phase: In this phase, the psycho-physical exposure takes place. The patients usually climb the rope in groups of up to six individuals. The sessions are guided by an experienced therapist and further assisted by two rope guides who are trained in securing patients during the exercises. It should be emphasized that the outdoor exposures take place regardless of the weather conditions (exceptions are heavy storms with thunder and lightning). The primary goal of the action phase is to facilitate change by providing the patient with a vivid experience of behavioural and cognitive responses to critical individual situations and conflicts. Moreover, potential solutions are introduced, tested and realized during this phase. (4)

Evaluation and transfer phase: Immediately after the exposure, each individual's coping skills are evaluated by the group, and transfer to real life is initiated according to the patient's work model. (5) Realization phase: In this final stage, the individual is encouraged to apply the newly learned behavioural and cognitive skills to concrete real life situations or areas of conflict. Thus, a strong emphasis is placed on the solution of specific current problems outside therapy.

### Instruments

#### Assessment of Potential Confounders

In order to evaluate potential selection bias due to the non-randomized group assignment, we assessed the motivation for treatment and the

Table 1. Demographic and clinical characteristics of the initial sample and follow-up completers

	Initial sample	FU completer sample			Test <sup>a</sup>
	Total 214 ≤ N ≤ 247	Total 134 ≤ N ≤ 157	High-rope 96 ≤ n ≤ 104	Controls 46 ≤ n ≤ 53	
Age (M, SD)	50.2 (10.5)	51.0 (9.2)	49.4 (9.3)	54.5 (8.1)	P = 0.003
Gender, female (%)	64	64	67	59	P = 0.275
Level of education (%)					P = 0.300
High ( <i>Abitur</i> )	69	75	80	63	
Medium ( <i>Realschule</i> )	18	15	12	22	
Low ( <i>Hauptschule</i> )	11	7	6	10	
Still in school	1	1	1	2	
Marital status (%)					P = 0.040
Single	21	20	22	14	
Married	55	58	58	57	
Divorced, separated, widowed	23	23	20	29	
ICD-10 diagnosis (%)					P = 0.288
F3	49	52	50	57	
F4	44	42	44	49	
F5	1	2	1	4	
Z73	3	3	5	0	

<sup>a</sup>Test statistics are based on the comparison of high-rope participants and controls in the completer sample. Student's *t* tests (two-sided) for continuous data and Pearson chi-square test for categorical data. ICD-10 = International Statistical Classification of Diseases and Health Related Problems, 10th revision. F3 = mood disorders. F4 = neurotic, stress-related and somatoform disorders. F5 = behavioural syndromes associated with physiological disturbances and physical factors (e.g., eating disorders). Z73 = problems related to life-management difficulty.

patient-rated early therapeutic alliance, as well as self-reported initial general distress and quality of life at intake. Treatment motivation was assessed from the patient's and therapist's perspective with a single-item measure (five-point scale) that was taken from the inpatient programme's standard documentation battery (PsyBaDo; Heuft & Senf, 1998). The therapeutic alliance was assessed with the 11-item German version of the Helping Alliance Questionnaire (Bassler, Potratz, & Krauthauser, 1995).

General symptom distress was assessed with the Klinisch Psychologisches Diagnosesystem-38 (KPD-38, Clinical Psychological Diagnostic System; Percevic et al., 2005), a 38-item self-report questionnaire that was developed for the outcome monitoring and treatment evaluation in psychotherapy. The KPD-38 consists of six subscales assessing the patient's general physical condition, psychological symptoms, social problems, competence skills, general life satisfaction and social support. In the present study, we used the KPD-38 total score, which is computed as the mean of the first five subscales.

Quality of life was assessed with the Fragebogen zur Erfassung der Lebenszufriedenheit (FLZ, Life Satisfaction Questionnaire), a 10-item self-report measure that measures a person's satisfac-

tion across 10 different life domains (Fahrenberg, Myrtek, Wilk, & Kreutel, 1986).

*Primary and Secondary Outcomes*

Depressive symptoms were assessed with the German version of the Beck Depression Inventory (BDI; Hautzinger, Bailer, Worall, & Keller, 2000). The BDI is a widely recognized, standardized and psychometrically sound 21-item self-report questionnaire for the assessment of depressive symptom severity. The items of the BDI are answered on a four-point scale. A sum score is computed that depicts an individual's present symptom distress ranging from 0 to 63, with higher values indicating stronger symptoms. In the present sample, Cronbach's alphas of the BDI sum score were 0.93 at admission and 0.90 at follow-up. Based on the distribution of scores in the clinical and norm populations (Hautzinger et al., 2000), a BDI score = 11.9 was used as a clinical cut-off score, which indicates clinically significant impairment.

Trait anxiety was assessed with the German version of the State-Trait Anxiety Inventory (STAI; Laux, Glanzmann, Schaffner, & Spielberger, 1981), which is one of the most widely used measures of symptoms of anxiety. In the follow-up, the 20-item

trait subscale (STAI-T) was used, which measures how individuals feel 'generally'. The trait scale is supposed to assess anxiety as a stable inter-individual difference in the disposition to respond to stressful situations with varying amounts of state anxiety. The items are answered on a four-point scale ranging from 'not at all' to 'very much'. The STAI-T scale is computed by adding the 20 items. In the present sample, Cronbach's alphas of the STAI-T were 0.92 for both intake and follow-up scores. STAI-T scores can range from 20 to 80, with higher scores representing higher levels of trait anxiety. Scores above the clinical cut-off score (STAI-T = 46; Fisher & Durham, 1999) indicate clinically significant impairment.

LOC and self-concept were assessed with the *Fragebogen zu Kompetenz- und Kontrollüberzeugungen* (FKK, Questionnaire of Competence and Control Beliefs; Krampen, 1991), a German adaptation of Levenson's (1972) internal-external control (IPC) scales. The 32 items of the FKK self-report questionnaire are answered on a six-point scale ranging from 'completely disagree' to 'completely agree'. Four eight-item primary subscales can be computed, self-efficacy (SK), internal LOC (I), perceived control by powerful others (P) and perceived control by chance (C). Moreover, two second-order scales, self-efficacy/internal LOC (FKK-SKI) and externality/external LOC (FKK-PC), are computed each consisting of 16 items. Scores of the FKK-PC and FKK-SKI can range from 16 to 96. In the present study, we used the two secondary scales. Reliabilities of the two scales were high, with Cronbach's alphas of 0.89 (FKK-SKI) and 0.91 (FKK-PC) for intake scores, and 0.87 (FKK-SKI) and 0.91 (FKK-PC) for follow-up scores.

Secondary outcomes of this study were self-reported work ability, number of sick days and service utilization during the follow-up period, which were assessed by single items in the follow-up questionnaire.

### Data Analysis

In the analyses, we controlled for baseline group differences on relevant covariates, as well as for pre-intervention differences on the outcome variables, which can impact outcome estimates due to regression to the mean (Shadish, Cook, & Campbell, 2002). To account for these potential biases, we used simple change scores of each of the four outcome measures as dependent variables. The change scores were computed as the difference between a patient's follow-up score and intake

score on the respective measure. On BDI, STAI-T, and FKK-PC, improvement is indicated by a negative change score, whereas improvement is indicated by a positive change score on the FKK-SKI. The reliabilities of the four change scores (Williams & Zimmerman, 1983) were 0.87 (BDI), 0.87 (STAI-T), 0.73 (FKK-PC) and 0.79 (FKK-SKI).

We used the general linear model to evaluate differences between the groups on each of the four change scores while statistically controlling for age, intake treatment motivation and initial level of distress on the respective outcome measures, as well as treatment duration (MANCOVA). In case of an overall significant model, separate models were tested for each of the four outcome criteria including all available subjects, again controlling for the covariates and adjusting for multiple tests using Bonferroni correction (based on a family-wise alpha < 0.05).

Proportions of patients who showed reliable changes and clinically significant changes (recovery) on the BDI and STAI-T at discharge and 24-month follow-up were analysed according to the approach outlined by Jacobson and Truax (1991). Finally, differences on the secondary outcomes—self-reported sick leave, work ability, need for further psychotherapy and service utilization—were analysed with Pearson chi-square tests.

## RESULTS

### Sample Characteristics

Because of the naturalistic study design, we analysed potential intake differences between high-rope participants and controls. In the completer sample, significant differences between high-rope participants and controls were related to age, marital status, initial therapy motivation, baseline trait anxiety and self-efficacy, as well as treatment duration (see Tables 1 and 2). There were no significant differences between the groups with regard to gender, diagnoses, therapeutic alliance, quality of life, general psychological distress, depressive symptoms, state anxiety and external LOC (all  $p > 0.05$ ).

Next, we compared demographic and clinical characteristics of the patients who responded to the follow-up questionnaire ( $n = 157$  completers) and patients who were lost to follow-up ( $n = 90$  non-completers). A small but significantly higher therapist-rated treatment motivation was found in completers ( $M = 3.9$ ,  $SD = 0.7$ ) as compared with non-completers ( $M = 3.7$ ,  $SD = 0.7$ ;  $F(1,240)$

Table 2. Intake clinical characteristics (M, SD) of the initial sample and follow-up completers

	Initial sample	FU completer sample			Test <sup>a</sup>
	Total 214 ≤ N ≤ 247	Total 134 ≤ N ≤ 157	High-rope 91 ≤ n ≤ 104	Controls 43 ≤ n ≤ 53	
Treatment duration (days)	50.4 (23.4)	51.0 (23.9)	54.7 (24.9)	43.9 (20.0)	P = 0.007
Motivation (patient rated)	4.4 (0.7)	4.5 (0.7)	4.6 (0.6)	4.2 (0.8)	P = 0.001
Motivation (therapist rated)	3.9 (0.7)	3.9 (0.7)	4.1 (0.6)	3.7 (0.8)	P = 0.001
Therapeutic alliance (HAQ)	1.5 (0.8)	1.4 (0.8)	1.4 (0.8)	1.4 (0.8)	P = 0.874
Life satisfaction (FLZ)	31.1 (8.2)	30.5 (7.7)	31.1 (7.2)	29.3 (8.5)	P = 0.185
General distress (KPD-38)	3.0 (0.5)	3.0 (0.5)	3.1 (0.4)	2.9 (0.5)	P = 0.085
Depression (BDI)	20.5 (10.2)	20.4 (9.5)	21.1 (9.4)	19.1 (9.7)	P = 0.243
State anxiety (STAI-S)	56.1 (11.3)	56.3 (11.2)	56.8 (10.7)	55.3 (12.0)	P = 0.465
Trait anxiety (STAI-T)	55.6 (9.0)	55.6 (8.3)	56.7 (7.7)	53.5 (8.8)	P = 0.026
Self-efficacy (FKK-SKI)	55.9 (11.2)	55.7 (10.7)	54.0 (10.3)	59.2 (10.9)	P = 0.008
Externality (FKK-PC)	55.8 (11.2)	55.9 (11.3)	56.3 (10.7)	54.9 (12.4)	P = 0.569

Except for motivation, helping alliance and self-efficacy, higher scores indicate higher levels of impairment.

<sup>a</sup>Test statistics based on the comparison of high-rope participants and controls in the completer sample using Student's *t* tests (two sided).

FU = 24-month follow-up. BDI = Beck Depression Inventory (Hautzinger et al., 2000). FLZ = Fragebogen zur Lebensqualität (Fahrenberg et al., 1986). FKK = Questionnaire for Competence and Control Beliefs (Krampen, 1991). HAQ = Helping Alliance Questionnaire (Bassler et al., 1995). KPD-38 = Klinisch Psychologisches Diagnosesystem-38 (Percevic et al., 2005). STAI = State-Trait-Anxiety Inventory (Laux et al., 1981).

= 4.51; *p* = 0.04). There were no significant differences between completers and non-completers on any of the other intake characteristics (all *p* > 0.05).

### High-Rope Utilization

The average number of exposures was *M* = 2.4 (SD = 1.1, *Mdn* = 2). Of the 104 patients in the rope condition, 19 patients (18%) were exposed once, 42 patients (40%) were exposed twice, and 31 patients (30%) were exposed three times. Twelve patients (12%) attended the high-rope sessions more than three times.

Most of the patients participated in the rope courses in the second half of their inpatient programme. Four participants (4%) attended their first rope session within their first week of treatment, 31 patients (30%) within the second week, 18 patients (17%) within the third week and 51 patients (49%) later than that. On average, a patient had stayed in the hospital for 25.5 days (SD = 16.1, *Mdn* = 19) until the first exposure was conducted. Spearman correlation analysis showed a positive association between the number of high-rope sessions and treatment duration, i.e., patients who stayed longer in the hospital attended more sessions (*r* = 0.43, *p* < 0.001). On average, the consecutive exposures were scheduled approximately 1 week apart (*M* = 9.1 days, SD = 5.9; *Mdn* = 7, *Mode* = 7). These results are in line with clinical and conceptual considerations that hold that two separate rope exposures

should be conducted in order to accomplish the full range of exercises. In addition, the time lag between two consecutive sessions should not be too long in order to enable patients to connect the experiences made on the rope.

### Primary Outcomes

In order to estimate the amount of symptom change achieved in both treatment groups during the two observation phases, we first assessed standardized pre-post differences as mean differences between discharge and admission scores divided by the standard deviation of the intake score. In the high-rope group, pre-post effect sizes were -1.5 for depressive symptoms, -1.4 for trait anxiety, 0.8 for self-efficacy and -0.7 for external control beliefs. The effect sizes in the control group were -1.1 (depressive symptoms), -0.7 (trait anxiety), 0.2 (self-efficacy) and -0.4 (external control beliefs).

Next, differences on the change scores between groups for each of the four outcome measures were analysed with the general linear model controlling for age, initial treatment motivation and intake levels of the four outcome variables, as well as treatment duration (MANCOVA). The model testing the group differences on all four outcome criteria simultaneously was significant (*F*(4,99) = 3.58, *p* = 0.003), prompting us to test each of the outcome criteria in a separate model using all available subjects. After Bonferroni adjustments

( $p < 0.0125$ ), high-rope participants showed significantly larger improvements in trait anxiety and self-efficacy than controls. The differences in change in depressive symptoms and external LOC failed to reach statistical significance (Table 3).

Effect sizes at follow-up were computed as differences between group means at follow-up divided by the pooled SD and corrected for admission differences. Regarding the primary outcome variables, the effect sizes were  $-0.8$  (trait anxiety),  $0.8$  (self-efficacy), and  $-0.5$  (depressive symptoms, external LOC) (Table 3).

We explored if the dosage of rope exposure was associated with the amount of change in the outcome variables by comparing the improvements in patients who had attended the ropes exposures once, twice, thrice or more than thrice. As shown in Figure 2, there was only a trend for a linear relationship with higher numbers of ropes exposures being associated with larger improvements until follow-up.

### Reliable and Clinically Significant Change

At admission, 80% of the high-rope participants and 77% of the patients in the control group scored above the clinical BDI cut point. Levels of trait anxiety exceeded the clinical cut point in 89% of the high-rope participants and 78% of the controls. In the following analyses, reliable change on the BDI was indicated by a five-point change (based on a reliability of 0.88; Hautzinger, 2002). Clinically significant change was marked by a five-point change that crossed the clinical cut point of 11.9 (Hautzinger et al., 2000). On the STAI-T, reliable change was indicated by an eight-point change (based on a reliability of 0.91; Laux et al., 1981). Recovery was marked by an eight-point change that crossed the clinical cut point of 46 (Fisher & Durham, 1999). As follows, we determined the proportions of patients who showed reliable and clinically significant change separately for the two observation periods, intake to discharge and intake to follow-up, using data from all available subjects.

### Admission to Discharge Change

With regard to change in depressive symptoms, 84% of the high-rope participants and 71% of the controls achieved reliable or clinically significant improvements during inpatient treatment (Table 4). 15% of the high-rope participants and 28% of the controls stayed unchanged. In both groups, only very few patients deteriorated during treatment.

Table 3. Depressive symptoms, trait anxiety, self-efficacy and LOC for high-rope participants and controls and results of univariate analyses of covariance on intake to follow-up difference scores

	High-rope				Controls				Test <sup>b</sup>	$d_{corr}$
	Intake	Discharge	Follow-up	Change [95% CI] <sup>a</sup>	Intake	Discharge	Follow-up	Change [95% CI] <sup>a</sup>		
BDI	21.2 (9.4)	6.1 (6.5)	10.2 (8.3)	-11.0 [-13.1; -8.9]	19.0 (9.8)	8.1 (6.7)	13.4 (10.2)	-5.7 [-8.0; -2.0]	$F(1,111) = 4.34$ $P = 0.04$	-0.50
STAI-T	56.6 (7.8)	46.0 (7.9)	46.7 (8.9)	-9.9 [-10.8; -7.1]	53.4 (8.9)	47.2 (9.8)	50.5 (10.8)	-3.0 [-5.5; -0.5]	$F(1,125) = 9.44$ $P = 0.003$	-0.79
FKK-SKI	54.0 (10.3)	61.9 (10.6)	63.0 (10.4)	8.2 [6.2; 9.8]	58.8 (10.8)	60.9 (10.7)	59.5 (13.4)	0.6 [-2.8; 2.6]	$F(1,122) = 7.21$ $P = 0.008$	0.78
FKK-PC	56.3 (10.8)	48.6 (11.3)	49.5 (11.8)	-6.8 [-8.2; -3.8]	55.2 (12.3)	50.7 (11.3)	54.5 (14.8)	-0.7 [2.8; -2.8]	$F(1,124) = 5.87$ $P = 0.017$	-0.46

<sup>a</sup>Change = mean raw change scores (follow-up score—intake score) with 95% CI.

<sup>b</sup>Statistics based on univariate ANCOVA testing between group differences on change scores, controlling for age, intake treatment motivation, treatment duration and intake levels of the respective outcome measure.

FU = follow-up.  $d_{corr}$  = standardized differences between groups at follow-up corrected for intake differences. BDI = Beck Depression Inventory (Hautzinger et al., 2000), FKK-SKI = self-efficacy subscale of the Questionnaire for Competence and Control Beliefs (Krampen, 1991). FKK-PC = external locus of control subscale of the Questionnaire for Competence and Control Beliefs. STAI-T = trait subscale of the State Trait Anxiety Inventory (Laux et al., 1981).

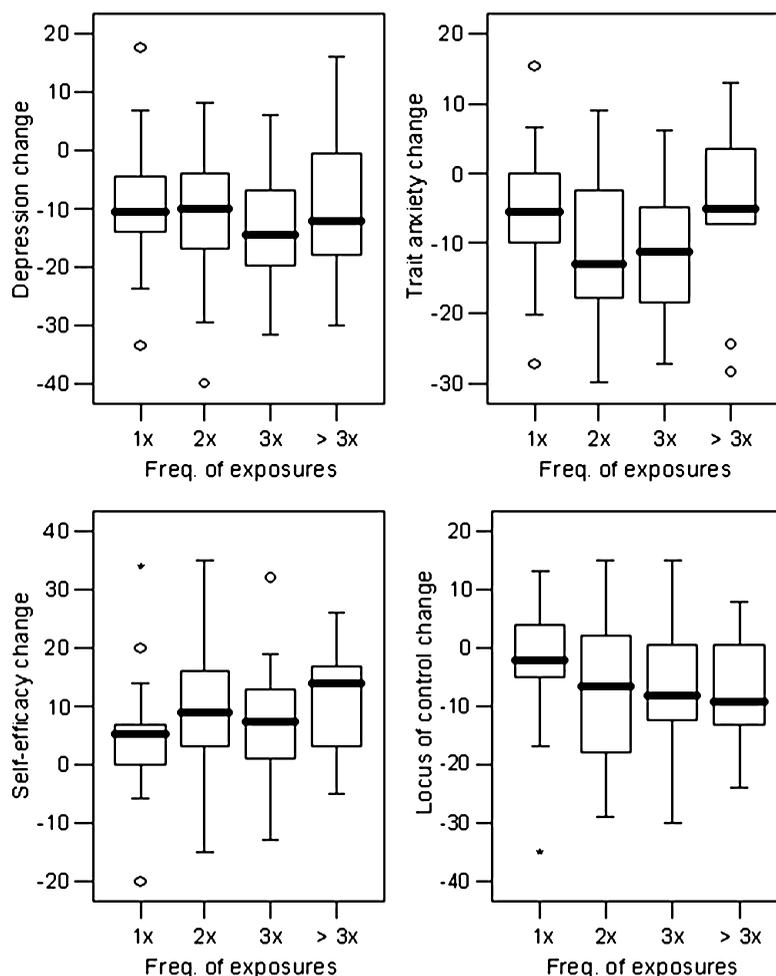


Figure 2. Change in primary outcomes as a function of number of rope exposures

As expected, large proportions of patients in both groups showed no change in trait anxiety, with 40% of the high-rope participants and 55% of the controls showing no change during inpatient treatment. Recovery or reliable improvements were observed in 57% of the high-rope participants and 42% of the controls. More specifically, about twice the number of patients showed recovery in the high-rope group (37%) as compared with that in the control group (18%; Table 4).

*Admission to Follow-Up Change*

When the observation period was expanded until the end of the follow-up, on the BDI only 10% of the patients in the high-rope group and 4% of the patients in the control group were in recovery (Table 4). Sixty-two per cent of the high-rope participants and 47% of the controls were classified

as reliably improved. The proportion of patients experiencing an increase in depressive symptoms was twice as high in the control group (16%) than in the high-rope participants (8%).

Regarding trait anxiety, deteriorations were much more likely in the controls (16%) than in the patients in the high-rope group (3%; Table 4). Moreover, the proportion of patients who showed reliable improvements was larger in the high-rope group (40%) as compared with that in the control group (18%). A small difference between the groups was found in the proportions of recovered patients.

*Secondary Outcomes*

No differences between the groups on the four secondary outcome variables were found (Table 5). In

Table 4. Proportions of reliable and clinically significant change (% with 95% CI) in high-rope participants and controls at discharge and at 24-month follow-up

	Intake to discharge				Intake to follow-up			
	-	0	+	++	-	0	+	++
BDI								
High-rope (%)	1 [0; 5]	15 [10; 23]	25 [18; 34]	59 [50; 68]	8 [4; 15]	20 [13; 29]	62 [52; 72]	10 [5; 18]
Controls (%)	1 [0; 8]	28 [19; 39]	29 [20; 41]	42 [31; 53]	16 [8; 29]	33 [21; 48]	47 [33; 61]	4 [1; 15]
STAI-T								
High-rope (%)	3 [1; 8]	40 [32; 49]	20 [14; 28]	37 [29; 46]	3 [1; 9]	43 [34; 53]	40 [31; 50]	13 [8; 22]
Controls (%)	3 [1; 10]	55 [43; 66]	24 [16; 35]	18 [11; 29]	16 [8; 28]	59 [45; 71]	18 [10; 30]	8 [3; 19]

CI = confidence interval. + = reliably improved. ++ = recovered (clinical significant change). 0 = unchanged. - = reliably deteriorated. BDI = Beck Depression Inventory (Hautzinger et al., 2000). STAI-T = trait subscale of the State Trait Anxiety Inventory (Laux et al., 1981).

Table 5. Secondary outcomes in high-rope participants and controls at follow-up

	High-rope		Controls		Test <sup>a</sup>
	<i>n</i>	%	<i>n</i>	%	
Sick leave ( <i>n</i> = 155)					<i>P</i> = 0.88
None	58	56	30	58	
1 month	22	21	12	23	
¼ year	6	6	2	4	
½ year	5	5	1	2	
Does not apply	12	12	7	14	
Capacity to work ( <i>n</i> = 153)					<i>P</i> = 0.29
Yes, full time	48	47	17	33	
Yes, part time	27	27	14	28	
No	21	21	14	28	
Questionable	6	6	6	12	
Need for psychotherapy ( <i>n</i> = 155)					<i>P</i> = 0.52
Yes, definitely	44	43	24	45	
Yes, probably	21	21	8	15	
No	34	33	17	32	
Not sure	3	3	4	8	
Service utilization ( <i>n</i> = 156)					<i>P</i> = 0.82
Yes, inpatient	4	4	3	6	
Yes, outpatient	57	55	26	49	
Yes, both	3	3	1	2	
None	39	38	23	43	

<sup>a</sup>Pearson chi-square test.

both groups, less than half of the patients reported sick leaves during the follow-up. A larger, but not significantly different, proportion of patients in the high-rope group (74%) judged themselves as being able to work full or part time compared with that in the controls (61%). In both groups, almost equal proportions of patients expressed their need for further psychotherapy or reported having utilized further inpatient or outpatient treatment during the follow-up period.

## DISCUSSION

In this study, we have introduced high-ropes courses as an adjunct intervention in inpatient psychotherapy. In order to investigate the effects of the rope exposures, we have conducted a pilot study comparing the outcomes in patients who had participated in the ropes courses during their inpatient programme and controls who had not participated in the ropes courses. In a prospective

controlled naturalistic study, a consecutive sample of 247 patients was assessed at intake to the inpatient programme, at discharge and at the 24-month follow-up. At follow-up, 157 patients (64%) had responded to the follow-up questionnaire. After controlling for age, treatment motivation, admission levels of the outcome variables and treatment duration, high-rope participants showed greater overall change than controls from admission to follow-up. According to Bonferroni-adjusted univariate analyses, the benefits were limited to trait anxiety and self-efficacy, whereas no significant differences were found in the external LOC and depressive symptoms between the groups.

Notably, among the four outcome variables used in the study, the personality variables showed most changes. On self-efficacy, a tendency for further improvements was found in participants but not in controls during follow-up, which might be interpreted as the lasting effects of a coping skills training (Smith, 1989). This finding is partly reflected by the literature on challenge programmes in which consistently small additional effects on self-efficacy are reported at follow-up (Gillis & Speelman, 2008; Hattie et al., 1997). Moreover, there was a small trend in the participants showing that improvements in personality variables increased with the number of exposures being attended. The results are in accordance with research from educational domains, which indicate that challenge programmes are useful means to enhance personal resources, such as self-efficacy, and initiate change in dysfunctional traits, such as trait anxiety in participants (Gillis & Speelman, 2008; Hans, 2000). Although the findings of the present study need to be interpreted with caution, there is preliminary indication that the ropes courses are specifically helpful in initiating change in trait resource variables.

The analyses of clinically significant change confirmed the results regarding trait anxiety. At the end of the inpatient programme, the number of patients recovered in the high-rope group was twice, compared with that in the control group. Moreover, up to the end of the follow-up period, deteriorations in trait anxiety were more prevalent in controls than in high-rope participants. It should be noted that the high-rope participants achieved better long-term outcomes, although they had received the same amount of additional treatment during follow-up. With regard to depressive symptoms, the larger rates of recovery in high-rope participants during treatment and less deterioration until follow-up must be interpreted with

caution due to overlapping 95% confidence interval (CI) of the estimates.

It could be argued that these change patterns—superior improvements in high-rope participants in anxiety but not in depressive symptoms—were due to potential self-selection of patients with anxiety disorders into the ropes intervention who, in turn, benefited most from the exposures. Thus, a closer inspection of the differential results comparing the diagnostic subgroups (68 depressive patients and 56 patients with anxiety disorders) seemed advisable. A two-way analysis of covariance, however, resulted in a non-significant interaction between the intervention group and diagnostic subgroup, indicating that the amount of change in trait anxiety until follow-up was not different for patients in the high-rope group and controls, depending on the diagnosis. Due to the limited sample size, the differential effects need further attention in future research.

Regarding the secondary outcome criteria, the results showed no benefits in favour of the high-rope participants. Similar numbers of patients in both groups rated themselves as being capable of working or were on sick leave during follow-up. Moreover, therapy utilization and expressed need for further psychotherapy were similar in high-rope participants and controls. Thus, although better outcomes were observed in the high-rope participants, these benefits failed to unfold practical consequences on need or utilization of further treatment. The evaluation of these objective criteria indicates that slightly better outcomes do not necessarily make a difference in terms of service utilization. From this perspective, it might be argued that the lack of practical consequences questions the costs of implementing a high-rope intervention. It should be considered, however, that despite the considerable amount of change achieved during the inpatient programme, a large proportion of patients in both groups still suffered from clinical symptoms at discharge, making further treatment necessary.

### *Limitations*

In this study, a number of limitations must be considered. First, the internal validity is reduced because randomization of patients to the treatment groups was not feasible under the conditions of clinical routine. We used a naturalistic design instead. Thus, the results may have been influenced by selection bias. Although we controlled relevant, potentially confounding covariates—i.e.,

age, treatment duration, therapy motivation and intake levels of the outcome variables—in our statistical model, the results must be regarded with caution, and no causal inference can be made regarding the effectiveness.

The ropes exposures were only one intervention among a larger number of interventions that patients received during their inpatient programme, such as individual psychotherapy and group therapy, or other psycho-physical activities. In this pilot study, we were not able to control for the amount or dosage of additional treatments. Thus, we cannot rule out that these might have biased the results of the study (e.g., by interacting with the high-rope intervention). As shown in the secondary outcomes, however, the amount of additional treatment during follow-up was almost equal for both groups.

The response rate of the follow-up assessments was only moderate, leading to a substantial decrease in the statistical power of the analyses. The loss to follow-up might be due to the long follow-up interval. However, since we were interested in the sustainability of the results particularly in regard to the resource trait variables, we gave preference to this long follow-up period. It should also be noted that the response rate is still in the range of comparable studies that assessed similar samples over such a long observation period (Haase et al. 2008; Nübling, Schmidt, & Wittmann, 1999; Puschner, Haug, Häfner, & Kordy, 2004).

From a clinical point of view, post-exposure euphoria has to be considered as a potential biasing factor in the evaluation of challenge programmes (Ewert & Sibthorp, 2009). Post-exposure euphoria refers to a short-term positive mood expression, or temporary excitement, based on the feelings of accomplishment following an experiential intervention (Marsh, Richards, & Barner, 1986), which may introduce bias between exposed and non-exposed groups. While these short-term effects might have impacted the post-treatment results in our study, it is unlikely that they have influenced the follow-up results. Moreover, we would expect post-exposure euphoria to influence state measures—i.e., self-reported depressive symptoms—more than personality or trait variables, on which we observed the largest effects.

Finally, the results cannot easily be generalized to other psychotherapy settings. The study was conducted in an inpatient setting, and our sample consisted of well-educated patients of older age. Moreover, both groups showed high initial impairment, and their treatment response was

exceptionally good. The pre–post changes found in the present study exceeded most of the average change reported in studies on treatment effectiveness in inpatient settings despite similar gender distributions, diagnoses, and treatment duration (e.g., Beutel, Höflich, Kurth, & Reimer, 2005; Franz et al., 2000; Haase et al., 2008).

### *Clinical Implications*

One surprising result of our study was that approximately two-thirds of the patients who met the inclusion criteria and about half of all patients who were newly admitted during the recruitment phase have faced the challenge to participate in the exposures (Mehl & Wolf, 2008). This finding further supports the assumption that challenge programmes are feasible and well accepted in psychotherapy patients. In contrast to real life outdoor challenge programmes ('adventure therapy'), the high-ropes course introduced in the present study offered a therapeutically controllable situation. This is a crucial factor, due to the fact that most patients need a sheltered environment in the acute treatment phase.

Several clinical processes are potentially initiated by the exposures. First, the challenge of climbing the high-rope provides the patient with a vivid experience of mastery, which in turn might increase self-confidence and related positive emotions. The strong experience might destabilize an individual's system of defence mechanisms and facilitate personal change (Kolb, 1984). If the therapy focus is on symptoms of anxiety, the ropes exercises might simply be used to induce and help overcome an individual's feelings of anxiety and insecurity.

Ropes course interventions are group treatments, although they are different from 'talking' group psychotherapy due to their strong experiential component. Like in group therapy, the group's response to the activities and experiences can affect the particular patient or the group as a whole. Group processes, such as the experience of social support and coherence, may be crucial for individual growth (Neill & Dias, 2001) and should be addressed by future research.

The main rationale of the psychotherapeutic ropes challenge is to enhance individual coping skills and to facilitate personal growth. In most clinical settings, the ropes exercises will be only one intervention among a multi-modal treatment targeting these treatment goals. The ropes course

intervention, as described in the current study, included a preparatory phase, psycho-physical exposures, debriefing, group reflections and individual transfer sessions. The present study indicates that, although difficult to accomplish, more research is warranted to analyse the efficacy of the exposures and to investigate the impact of these various clinical ingredients in different subgroups of psychotherapy patients.

REFERENCES

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bassler, M., Potratz, B., & Krauthauser, H. (1995). Der Helping Alliance Questionnaire (HAQ) von Luborsky. Möglichkeiten zur Evaluation des therapeutischen Prozesses von stationärer Psychotherapie. *Psychotherapeut*, 40, 23–32.

Berman, D.S., & Anton, M.T. (1988). A wilderness therapy program as an alternative to adolescent psychiatric hospitalization. *Residential Treatment for Children and Youth*, 5, 41–53.

Beutel, M.E., Höflich, A., Kurth, R.A., & Reimer, Ch. (2005). Who benefits from inpatient short-term psychotherapy in the long run? Patients' evaluations, outpatient after-care and determinants of outcome. *Psychology and Psychotherapy: Theory, Research and Practice*, 78, 219–234.

Cason, D., & Gillis, H.L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *Journal of Experiential Education*, 17, 40–47.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Conley, L., Caldarella, P., & Young, E. (2007). Evaluation of a ropes course experience for at-risk secondary school students. *Journal of Experiential Education*, 30, 21–35.

Davis-Berman, J., & Berman, D.S. (1989). The wilderness therapy program: An empirical study of its effects with adolescents in an outpatient setting. *Journal of Contemporary Psychotherapy*, 19, 271–281.

Eickenaes, I., Gude, T., & Hoffart, A. (2006). Integrated wilderness therapy for avoidant personality. *Nordic Journal of Psychiatry*, 60, 275–281.

Ewert, A. (1988) Reduction of trait anxiety through participation in Outward Bound. *Leisure Sciences*, 10, 107–117.

Ewert, A., & Sibthorp, J. (2009). Creating outcomes through experiential education: The challenges of confounding variables. *Journal of Experiential Education*, 31, 376–389.

Fahrenberg, J., Myrtek, M., Wilk, D., & Kreutel, K. (1986). Multimodale Erfassung der Lebenszufriedenheit: Eine Untersuchung an Herz-Kreislauf-Patienten. *Psychotherapie, Psychosomatik, Medizinische Psychologie*, 36, 347–354.

Fisher, P.L., & Durham, R.C. (1999). Recovery rates in generalized anxiety disorder following psychological

therapy: An analysis of clinically significant change in STAI-T across outcome studies since 1990. *Psychological Medicine*, 29, 1425–1434.

Franz, M., Janssen, P.L., Lensche, H., Schmidtke, V., Tetzlaff, M., Martin K., Wöller, W., Hartkamp, N., Schneider, G., & Heuft, G. (2000). Effekte stationärer psychoanalytisch orientierter Psychotherapie—eine Multizenterstudie. *Zeitschrift für Psychosomatische Medizin und Psychotherapie*, 46, 242–258.

Fry, S.K., & Heubeck, B.G. (1998). The effects of personality and situational variables on mood states during outward bound wilderness courses: An exploration. *Personality and Individual Differences*, 24, 649–659.

Gass, M.A. (1991). Enhancing metaphor development in adventure therapy programs. *Journal of Experiential Education*, 14, 8–13.

Gass, M.A. (1993). *Adventure in therapy: Therapeutic applications of adventure programming in mental health settings*. Boulder, CO: Association for Experiential Education.

Gass, M.A., & McPhee, P.J. (1990). Emerging for recovery: A descriptive analysis of adventure therapy for substance abusers. *Journal of Experiential Education*, 13, 29–35.

Gillis, H.L., & Speelman, E. (2008). Are challenge (ropes) courses an effective tool? A meta-analysis. *Journal of Experiential Education*, 31, 111–135.

Grawe, K. (2004). *Psychological therapy*. Göttingen: Hogrefe.

Haase, M., Frommer, J., Franke, G.-H., et al. (2008). From symptom relief to interpersonal change: Treatment outcome and effectiveness in inpatient psychotherapy. *Psychotherapy Research*, 18, 615–624.

Hahn, K. (1957). *Outward Bound*. New York: World Books.

Hans, T. (2000). A meta-analysis of the effects of adventure programming on locus of control. *Journal of Contemporary Psychotherapy*, 30, 33–60.

Hattie, J., Marsh, H.W., Neill, J.T., & Richards, G.E. (1997). Adventure education and Outward Bound: Out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67, 43–87.

Hautzinger, M. (2002). BDI—Beck Depressions Inventar. In E. Brähler, J. Schumacher, & B. Strauß (Eds), *Diagnostische Verfahren in der Psychotherapie* (pp. 32–34). Göttingen: Hogrefe.

Hautzinger, M., Bailer, M., Worall, H., & Keller, F. (2000). *Beck Depressionsinventar (BDI). Bearbeitung der deutschen Ausgabe. Testhandbuch*. Huber: Bern.

Heckhausen, H. (1991). *Motivation and action*. New York: Springer.

Heuft, G., & Senf, W. (1998). *Praxis der Qualitätssicherung in der Psychotherapie: Das Manual zur Psy-BaDo*. Stuttgart: Thieme.

Jacobson, N.S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59, 13–19.

Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Krampen, G. (1991). *Fragebogen zu Kompetenz- und Kontrollüberzeugungen (FKK)*. Göttingen: Hogrefe.

- Laux, L., Glanzmann, P., Schaffner, P., & Spielberger, C.D. (1981). *Das State-Trait-Angstinventar. Theoretische Grundlagen und Handanweisung*. Weinheim: Beltz.
- Levenson, H. (1972). Distinctions within the concept of internal-external control: Development of a new scale. *Proceedings of the 80th Annual Convention of the American Psychological Association*, 7, 261–262.
- Marsh, H.W., Richards, G.E., & Barnes, J. (1986). Multi-dimensional self-concepts: The effects of participation in an Outward Bound program. *Journal of Personality and Social Psychology*, 50, 195–204.
- Mehl, K., & Wolf, M. (2008). Erfahrungsorientiertes Lernen in der Psychotherapie: Evaluation psychophysischer Expositionen auf dem Hochseil im Rahmen eines multimethodalen stationären Behandlungskonzeptes. *Psychotherapeut*, 53, 35–42.
- Neill, J.T., & Dias, K.L. (2001). Adventure education and resilience: The double-edged sword. *Journal of Adventure Education and Outdoor Learning*, 1, 35–42.
- Nübling, R., Schmidt, J., & Wittmann, W. (1999). Langfristige Ergebnisse psychosomatischer Rehabilitation. *Psychotherapie, Psychosomatik, Medizinische Psychologie*, 49, 343–353.
- Percevic, R., Gallas, C., Wolf, M., Haug, S., Hünerfauth, T., Schwarz, M., & Kordy, H. (2005). Das Klinisch Psychologische Diagnosesystem (KPD-38): Entwicklung, Normierung und Validierung eines Selbstbeurteilungsbogen für den Einsatz in Qualitätssicherung und Ergebnismonitoring in der Psychotherapie und psychosomatischen Medizin. *Diagnostica*, 51, 134–144.
- Presson, P.K., & Benassi, V.A. (1996). Locus of control orientation and depressive symptomatology: A meta-analysis. *Journal of Social Behavior and Personality*, 11, 201–212.
- Priest, S., & Gass, M.A. (2005). *Effective leadership in adventure programming* (2nd ed.). Champaign, IL: Human Kinetics.
- Puschner, B., Haug, S., Häfner, S., & Kordy, H. (2004). Einfluss des Behandlungssettings auf den Gesundheitsverlauf. *Psychotherapeut*, 49, 182–192.
- Shadish, W.R., Cook, T.D., & Campbell, D.T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Smith, R.E. (1989). Effects of coping skills training on generalized self-efficacy and locus of control. *Journal of Personality and Social Psychology*, 56, 228–233.
- Stich, T.F., & Senior, N. (1984). Adventure therapy: An innovative treatment for psychiatric patients. *New Directives for Mental Health Services*, 21, 103–108.
- Voight, A. (1988). The use of ropes course as a treatment modality for emotionally disturbed adolescents in hospitals. *Therapeutic Recreation Journal*, 22, 57–64.
- Williams, R.H., & Zimmerman, D.W. (1983). The comparative reliability of simple and residualized difference scores. *Journal of Experimental Education*, 51, 94–97.
- Wilson, S.J., & Lipsey, M.W. (2000). Wilderness challenge programs for delinquent youth: a meta-analysis of outcome evaluations. *Evaluation and Program Planning*, 23, 1–12.