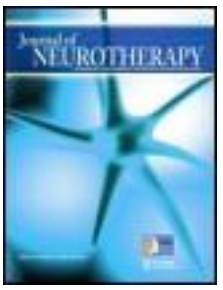

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Treatment of Dissociative Identity Disorder with Neurotherapy and Group Self-Exploration

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TREATMENT OF DISSOCIATIVE IDENTITY DISORDER WITH NEUROTHERAPY AND GROUP SELF-EXPLORATION

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The efficacy of integrating Neurofeedback techniques with internal self-exploration was evaluated as a procedure for the treatment of Dissociative Identity Disorder (DID). These procedures employed a modification of the alpha/theta neurofeedback procedures previously described by Peniston and Kulkosky (1991). Eleven female subjects meeting DSM-III-R (1987) criteria for DID were provided with 30 sessions of Neurofeedback and 10 group sessions as treatment. Subjects were administered the Millon Clinical Multiaxial Inventory-II (Millon, 1987) and the Global Assessment of Functioning scale (DSM-III-R, 1987) before and after 30 neurofeedback sessions. One to three years post treatment, subjects completed a Dissociative Experience Scale questionnaire (Bernstein and Putnam 1986) to assess the long term efficacy of treatment.

Neurofeedback training coupled with internal self-exploration served as an effective treatment modality for the unification of patients with DID. Of 11 patients treated, 11 were assessed as unified post treatment. All subjects scored as normal on the Dissociative Experience Scale (Bernstein and Putnam, 1986) for at least one year post treatment.

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Treatment approaches for Dissociative Identity Disorder [DID; formally designated as Multiple Personality Disorder] tend to focus on just one aspect of therapy (e.g. neurochemical, spiritual or psychological), with little regard for the psychobiological significance of trance states and their neuro-adaptive significance. Clinicians often become so fascinated with the psychodynamic defense constructs of mind (personalities) that they fail to adequately address the co-morbid personality (Smith,1991) or the neurologic phenomenon underlying trance, hypnotizibility and dissociative states (Putnam, 1984). Some speculate that DID may be a form of hypnosis used by constitutionally vulnerable individuals to cope with extraordinary trauma (Putnam, 1984; Speigel and Bliss, 1985; Stutman and Bliss, 1985). Others suggest that traumatized individuals in response to

survival pressures revert to "old brain" survival mechanisms (MacLean and Papez, 1981). The reversion to "old brain" defenses is believed to indicate that the content of trauma related memory sets has an internal state-dependent nature (Rossi, 1986). If true, then treating a person with DID would require altering consciousness so that what is unconscious (outside conscious awareness) can be merged and synthesized into conscious awareness. The preunification phase of treatment is that of helping the patient recover dissociated memories, knowledge, affect, sensation and behavior and allowing their normal continuous consciousness to emerge.

Peniston and co-workers (Peniston, 1991; Peniston, 1986; Peniston, 1993; and Peniston, 1990) report that neurofeedback is a process by which patients can be trained to remain partly conscious and still access traumatic anxiety-provoking images, thus allowing the integration of past traumatic experiences with previously unresolved conflicts within the context of anxiety-free memories of a newly learned state of consciousness. Based on these reports, we hypothesized that the integration of neurofeedback techniques with internal self-exploration could allow DID patients to utilize their mind's own naturalistic means of self-healing through an experience of reassociation and reorganization of their own experiences to bring about unification. A brain state achievable through neurofeedback (i.e., a window of opportunity) could enable patients to integrate traumatic memories while in a state of low arousal, thereby minimizing the risk of retraumatization (Kissin, 1986).

We report here results of a retrospective study of the clinical changes in personality and behavior following the treatment of 11 female subjects with 30 neurofeedback and 10 group sessions. A follow-up assessment employing the Dissociative Experience Scale (DES) (Bernstein, 1986) was used to assess long term efficacy of unification.

Methods and Procedures

Subjects

Subjects in this study were 11 white females who were referred to Freshwater Clinic (Columbus, Ohio) for treatment of DID. All met DSM-III-R (1987) criteria for a diagnosis of DID. They were the first 11 subjects to meet the group criterion for inclusion in this study. They were not selected from any population or group by the author's choice. The subjects gave written informed consent to allow their data to be used for research purposes. A structured interview, using the Dissociative Disorder Interview Schedule (DDIS) (Ross, 1989), was used to assess previous traumatic experiences and to differentiate DID from other clinical diagnoses which present with similar symptomatology (i.e., Psychogenic Fugue, Depersonalization Disorder, Psychogenic Amnesia as well as Personality Disorders). The average age for the group was 41.1 +/- 8.0 years (mean +/- SD) and ranged from 26 to 50 years in age. The average number of years of education was 16 +/- 2.6 years, with a range from 12 to 21 years. All subjects reported a history of childhood physical and emotional abuse; had recurrent thoughts of death, suicide and the desire to be dead; amnesiac episodes prior to treatment; and had at least experienced previous outpatient mental health services. Nine of the subjects had experienced previous psychiatric hospitalization, seven attended Alcoholics Anonymous meetings, six reported satanic ritualistic abuse, two had medically documented head injury, two suffered from seizures, and one had been incarcerated. Ten of the subjects were working at the

time of treatment. None of the subjects were taking psychotropic medications during the course of treatment.

Psychological Tests

The Millon Clinical Multiaxial Inventory (MCMI-II) (Millon, 1987) was administered to subjects prior to treatment, after the 30th session of treatment, and at follow-up time from 7 to 25 months after unification. The tests are computer generated as part of the services offered by the National Computer Testing Services. A Global Assessment of Functioning (GAF) (DSM-III-R, 1987) was determined for each subject prior to and after 30 neurofeedback training sessions. To assess the long term efficacy of treatment, each subject completed a Dissociative Experience Scale (DES) (Bernstein, 1986) test which was performed from 13 to 27 months after completion of the 30 neurofeedback sessions.

Pre-Training Procedures

Prior to the start of neurofeedback training, all of the subjects were tested for hand temperature. Two were found to meet a criterion of maintaining a hand temperature of 95 degrees fahrenheit for three consecutive one half hour sessions, while 6 were given 1 - 12 handwarming training sessions to learn to elevate their hand temperature above 95 degrees fahrenheit to meet the criterion. All subjects were given a copy of Peniston and Kulkosky's (1991) paper describing Alpha/Theta Brainwave neurofeedback training, information on how to interpret Alpha and Theta auditory feedback, and were requested to sign a contract to not harm self or others nor to use mood altering drugs or alcohol during treatment, as well as to write out two positive visualizations: (a) a new behavior they wished to attain when unified and, (b) a description of a scene where they choose not to participate in self destructive or addictive behaviors, as applicable. The therapist provided each subject with a third visualization in which the subject sees herself as a person who knows, feels, senses and behaves as one (unified). The explanation offered to subjects was that when they were abused, their awareness of the abuse was dissociated into separate states of knowing, acting, feeling and sensing resulting in their coming to view these states as personalities separate from themselves, thus enabling them to function without personal disorganization. It was emphasized that dissociation was once a means of survival and that no part of them would "die" as a result of unification. None of the alter personalities were addressed by name; all subjects were addressed by their legal name only. The subjects were informed that treatment for their dissociative disorder meant entering a state of consciousness that would enable phenomena that were subconscious and unconscious (i.e., dissociated) to merge into conscious awareness. Further, it was explained that they may experience their memories behaviorally, affectively, sensorially, and/or by knowledge (Braun, 1988). In addition, they were told that they may experience an event as if it were happening in the present. A hand signal was agreed upon if they wanted assistance during any abreactive process.

Neurofeedback Training (30 sessions)

For neurofeedback training, subjects arrived 15 minutes before the scheduled session for attachment of EEG electrodes, using the International Ten-Twenty electrode placement locations (Jasper, 1958). Ear lobes were employed as reference location sites and the forehead as the site for the required ground. The

Table 1
Description of Neurofeedback Training Protocol Procedures

Protocol	Audio Feedback Parameters	Responses Monitered [%]
RCH1 30 Minutes	AUDIO1 (300Hz)= IF (THETA >2.5* BETA & THETA>INHIBIT) AUDIO2 (400Hz)= IF (ALPHA>THRESHOLD	TIME Beta>Alpha TIME Theta>Alpha TIME Alpha>3.5* Beta TIME Theta>4*Beta & Theta>Inhibit TIME Audio1 (Theta) Meets Criteria TIME Audio2 (Alpha) Meets Criteria
RCH2 30 Minutes	AUDIO1 (300Hz)= IF (THETA <3*BETA & THETA>INHIBIT) AUDIO2 (400Hz)= IF (ALPHA >THRESHOLD)	TIME Beta>Alpha TIME Theta>Alpha TIME Alpha>3.5*Beta TIME Audio1 (Theta) Meets Criteria TIME Audio2 (Alpha) Meets Criteria
RCH3 10 Minutes	AUDIO1 (600 Hz)= IF (BETA > THRESHOLD) AUDIO2 (500 hZ)= IF (BETA > INHIBIT)	TIME Beta>Threshold1 TIME SMR>Threshold TIME Audio1 (Beta) Meets Criteria

recording electrode was placed at the left occipital site (i.e., O1). Electrode impedances were checked, using a maximum acceptable value of 5k Ohms. EEG recording employed the Neurosearch 24 and Biolex software system purchased from Lexicor Medical Technology (Boulder, CO).

The EEG frequency bands used for this work are as follows: delta= 0 to 4 Hz, theta= 4 to 8 Hz, alpha= 8 to 12 Hz, alpha1= 8 to 10 Hz, alpha2= 10 to 12 Hz, SMR= 12 to 15 Hz, beta= 16 to 20 Hz, and muscle activity EMG= 26 to 32 Hz. The length of each training session was 30 minutes and the EEG activity sampled at a rate of 128 samples per sec.

Based on previous reports (Peniston and Kulkosky, 1991; Green, Green and Walters, 1970), it was hypothesized that personality states manifested by DID subjects were a result of memories held encapsulated in the reactive subconscious (a perceptual and cognitive organization characterized as primitive) Therefore, patients could train through neurofeedback to use their proportion of theta to beta ratio to remain alert (i.e., increase beta) while in the reverie state (i.e., increased theta) and re-experience their traumatic memories without the distortions that occur in the dream process or through hypnosis. Thus, as reported by Peniston and Kulkosky (1991), alpha/theta neurofeedback treatment could enable the patient to enter a hypnagogic reverie state, begin processing repressed anxiety-provoking events therefore lessening the likelihood of relapse. A critical factor here is the ratio of theta to beta activity. The inhibition of neurofeedback when the ratio of theta to beta activities get too high serves to prevent a patient from going too deep into the unconscious and forgetting what they have experienced and/or dissociated from conscious awareness.

Three different training protocols were used in the study as outlined in Table I.

All subjects were started on protocol RCH1, which was designed to track the shift from high frequency alpha (Alpha2) to low frequency alpha (Alpha1) during the course of treatment. Individuals found to produce elevated amplitudes of Alpha2 frequency had difficulty in producing activity of Alpha1 frequency because they were unable to "empty" their minds. The mind free of "thoughts" produces an alpha response that has a higher amplitude of Alpha1 frequency.

The use of protocols RCH2 or RCH3 with any given subject was determined on the basis of the observed ratio of theta to beta activities during a training session. The RCH2 protocol was used when a patient's theta to beta ratio dropped below 1.0. This "deepening" protocol allows those who can, to evaluate their theta states while remaining aware of the unconscious processes and phenomena. The RCH3 protocol was employed with subjects who had theta to beta ratios above 3.0 during a treatment session. These subjects tended to decompensate with the alpha/theta training or to fall asleep. This protocol was designed to enhance the EEG amplitude in the beta and/or SMR frequency ranges.

For each protocol, two audio feedback tones were employed, one at a lower frequency (i.e., 300 or 500 Hz) and the other at a higher frequency (i.e., 400 or 600 Hz), respectively. The meaning of each of these tones depended upon the protocol described in Table I.

Audio feedback tones were inhibited if delta activity was greater than 30 uVolts in magnitude or if EMG activity was greater than 15 uV (i.e., used as a control for movement or artifact signals). With

RCH1 and RCH2 protocols, feedback tones were inhibited if activity in the beta band was greater than 12 uVolts in magnitude. For the RCH1 and RCH3 protocols, the feedback tones were also inhibited if the level of theta activity was more than 3 times that of the beta activity; whereas with RCH2, this ratio was 2.5 times beta activity.

In a fashion similar to that used by Peniston (Peniston and Kulkosky, 1991), during the first treatment session, subjects were shown a model of the brain and the location of the limbic system. They were also told that this area of the brain was believed to be the center of the unconscious mind and they were asked to close their eyes and visualize this area of their brain and to notice how the tones were generated by their brain rhythms during neurofeedback training. The meaning of the tones was explained and they were told to notice how they responded physiologically and psychologically when they heard the high and low pitched feedback tones. Finally, they were instructed that they could produce the desired tones yet remain passive and observant.

To start each session, they were asked to go through the visualizations previously prepared. After 5 minutes, they were instructed to ask their unconscious mind to take them back in time and resolve the conflicts that were maintaining their dissociative disorder. As the treatment progressed, these instructions were modified to meet the individual treatment needs of the patient. The therapist remained in the room during the treatment, but refrained from talking.

After 30 minutes, the subjects were asked to remain seated and report, if they wished, everything they recalled during the neurofeedback training session. The therapist recorded all memories, images, colors, somatic sensations, sounds, etc., in the order that the subject reported them. The manifest content was explored with the subject. Any symbols and associations were discussed with the subject and explored in terms of their meaning in their life today.

Neurofeedback Group (10 sessions)

Subjects joined group when they began neurofeedback training, with each group size from 6 to 8 participants. The results of the neurofeedback sessions were the only item on the agenda. Each person was given 5-10 minutes to share significant content or insights from their week of individual work. Any remaining time was given to open, collective feedback on the material shared by each person. Subjects were asked to make a verbal affirmation at the beginning of each group (i.e., I can have my memories without dissociating).

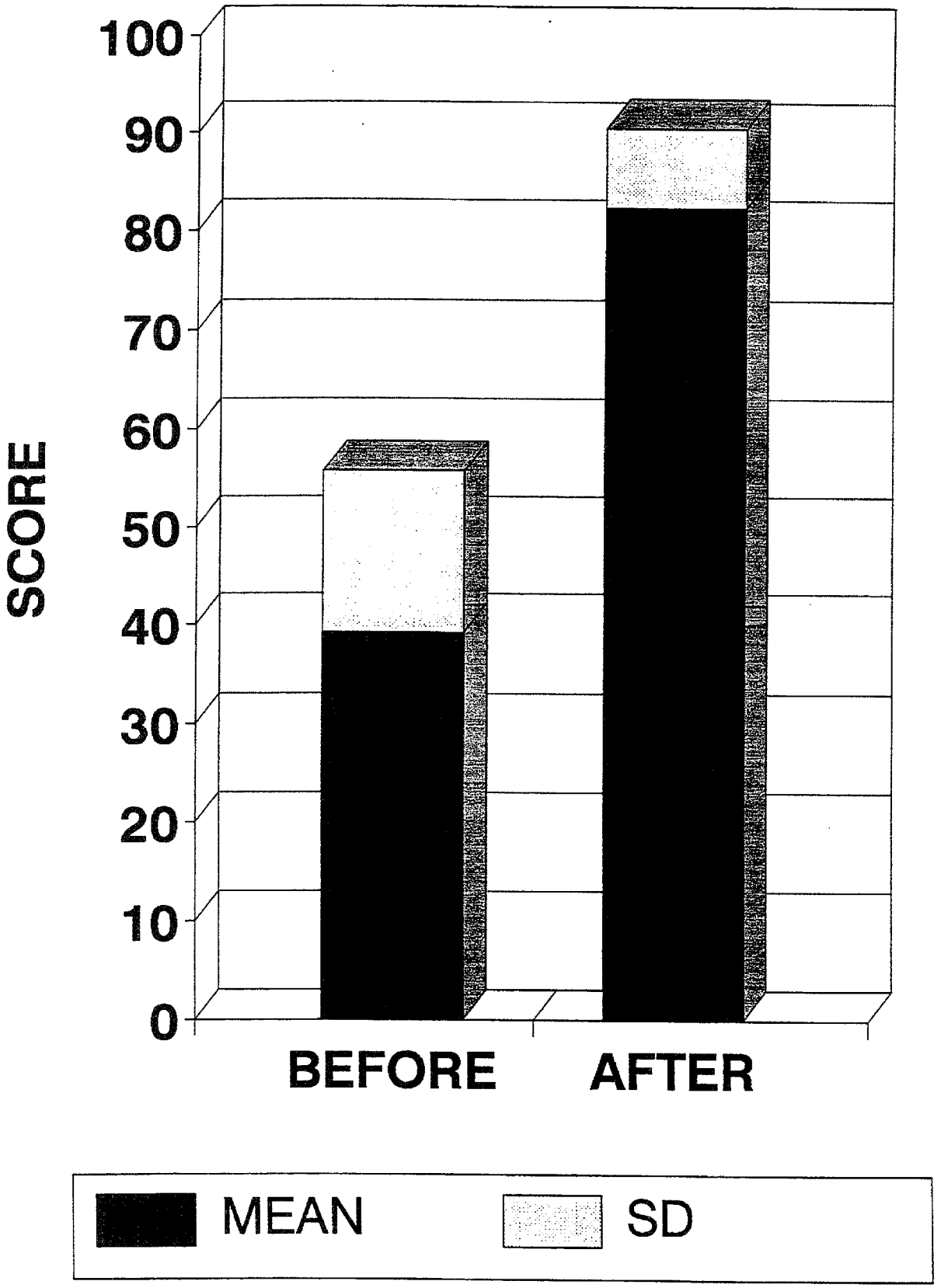
RESULTS

At the end of 30 neurofeedback treatments and 10 group sessions, all 11 of the subjects met Kluft's (1988) criterion for unification, a stage during treatment when the defensive constructs of the mind (i.e., alter personalities) blend into one. Test results of GAF (DSM-III-R, 1987) given in Figure 1 show a highly significant increase in test score, which correlates with major improvements in social, emotional and behavioral functioning. The average post treatment score of 82 for the group is within the range of normal values.

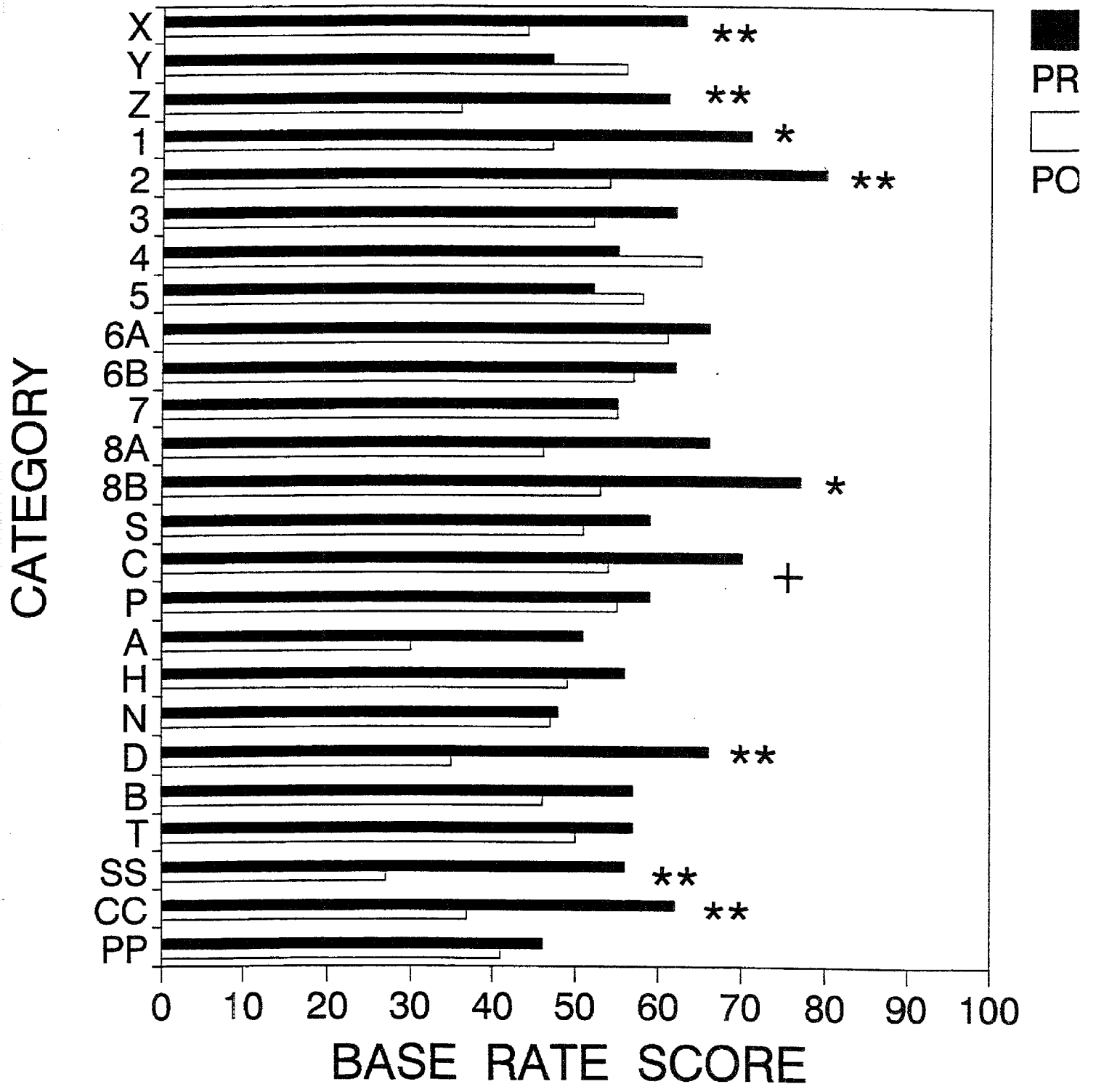
The average pre-treatment and post-treatment Base Rate (BR) scores for the MCMI-II (Millon, 1987) are given in Figure 2.

For the pre-treatment group, 4 of the categories scored 70 or above. These categories were CP1 (schizoid), CP2

GLOBAL ASSESSMENT of FUNCTION



MILLON SCORES
PRE & POST TREATMENT



(avoidant), CP-8B (self-defeating) and SPP-C (borderline). Eight of the categories had scores between 60 and below 70. These were MIX (disclosure), MIZ (debasement), CP3 (dependent), CP6A (antisocial), CP6B (aggressive/ sadistic), CP8a (passive aggressive), CSD (dysthymic disorder), and SSCC (major depression). For the post-treatment group, no category had an average score of 70 or greater, and only 2 had a score greater than 60. These were CP4 (histrionic) and CP6A (antisocial).

Comparisons between the pre and post treatment test scores, however, showed significant improvement in 7 out of the 22 scales based on an analysis by Kruskal-Wallis Anova By Ranks test. These categories are schizoid (CP1, $p< 0.04$), avoidant (CP2, $p< 0.02$), self-defeating (CP8b, $p< 0.04$), borderline (SPPD, $p< 0.02$), CSD (dysthymic disorder (CSD, $p< 0.02$), thought disorder (SSSS, $p< 0.02$), and major depression (SSCC, $p< 0.01$). The test score for the scale borderline and anxiety were very close to being statistically significant (i.e., $p< 0.056$ and 0.071, respectively). It is interesting to note that there was a reversal in pattern of the MIX, MIY and MIZ categories between the pre and post treatment condition.

A follow-up Millon (Millon, 1987) assessment of these subjects was performed 7 months to 25 months following 30 sessions of treatment. The individual time periods following completion of treatment and the individual Millon (Millon, 1987) test results are given in Table II.

Compared to the 30 sessions treatment scores, the group average scores indicate the subjects were able to maintain their post treatment gains over time.

To further assess the long term efficacy of treatment, all subjects were asked to complete a DES questionnaire. The individual time periods after the 30 treatment sessions and DES (Bernstein,

Table 3
Follow-up Assessment of UnificationDissociative Experience Scale

Subject	Months	Score
2	14	8.6
3	27	7.8
4	22	3.9
6	22	5.2
8	22	11.9
9	22	4.2
10	20	5.1
11	18	15.8
16	16	13.2
17	15	7.2
33	13	18.5
		Mean.....9.2
		SD.....4.7
Reference Test Ranges Scores [%]	>75 = Fake	
	>35 to 75 = DID	
	20 to 75 = PTSD	
	<20 = Normal Range	

scores are given in Table III.

The time periods following treatment and unification ranged from 13 to 27 months. The individual DES (Bernstein, 1986) scores were all well below the 20% upper limit of the range for normal values for this test, below the scores for PTSD (i.e., 20% to 35%) and for DID (i.e., 35% to 75%).

All 11 subjects in a post treatment interview agreed that the group process was instrumental in making them feel that they were part of a group who shared common experiences and feelings, thus abating their feelings of being alone and isolated. They also felt the group experience gave them a sense of hope that they were taking part in a process that would lead to recovery from their dissociative disorder.

Discussion

This study retrospectively investigated the clinical changes in personality and behavior in 11 female DID subjects who received neurofeedback treatment and group, using data from the MCMI-II (Millon, 1987) and the DES (Bernstein, 1986). The highest mean MCMI-II Base Rate (BR) Scores (70 and above) before treatment were on categories Schizoid, Avoidant, and Self-Defeating. According to Fink (1991), "Most DID patients are actively avoidant." Their isolation, seclusiveness, and detachment from others and the world are an active defensive effort to avoid emotional injury and the pain of interpersonal involvement. It represents and adaptive stance resulting from feelings of extreme vulnerability. Millon (1987) described individuals with self-defeating character types as relating to others in a self-sacrificing manner. They allow and perhaps encourage others to exploit or take advantage of them, focusing on their worst features. They typically act in an unassuming and self-effacing way and often intensify their deficits and place themselves in an inferior light. Five of the 11 subjects met criteria for the diagnosis of Borderline Personality Disorder due to their unusual thinking, dyscontrol, and deviant reasoning caused by intrusive post traumatic stress disorder symptoms (Putnam, 1986). Current evidence suggests that Schizoid personality disorder may reflect the interplay of trauma, including the dissociative responses, with specific sets of vulnerabilities related to the individual's psychobiologic substrate (Fink, 1991).

These improvements in the Millon scores were still evident from 7 to 25 months following unification (see results in Table II). As a group, no significant amplitude changes in alpha, theta, or beta were noted. However, a statistically significant increase in alpha threshold was observed between initial threshold settings and the threshold setting employed by the end of the 30 neurofeedback training sessions. Of 10 subjects, the alpha threshold level employed increased in 8 individuals with training (this gave a Fisher exact probability of 0.01). This suggests that subjects identify some specific frequency component in the EEG for enhancement. Thus, to maintain a consistent level of performance reinforcement, the threshold setting must be increased. The standard EEG frequency bands used in these studies (i.e., alpha, theta and beta) contain multiple narrow width frequency bands, one of which could closely correlate with clinical changes and account for the increase in alpha threshold with training. An increase in one component along with a comparable decrease in another would explain why the broad, standard frequency bands employed do not show a consistent, significant change with training.

The DES (Bernstein, 1986) was administered to determine the long term integrated effects of Neurofeedback training and group on prevention of decompensation and relapse. As evident in Table III, all subjects scored in the normal range after 13 to 27 months following treatment, suggesting that the subjects were able to maintain their post treatment gains over time. Subjects reported that the neurofeedback treatment process enabled them to bring their dissociated memories into conscious awareness and to develop co-consciousness with their alters without dissociating.

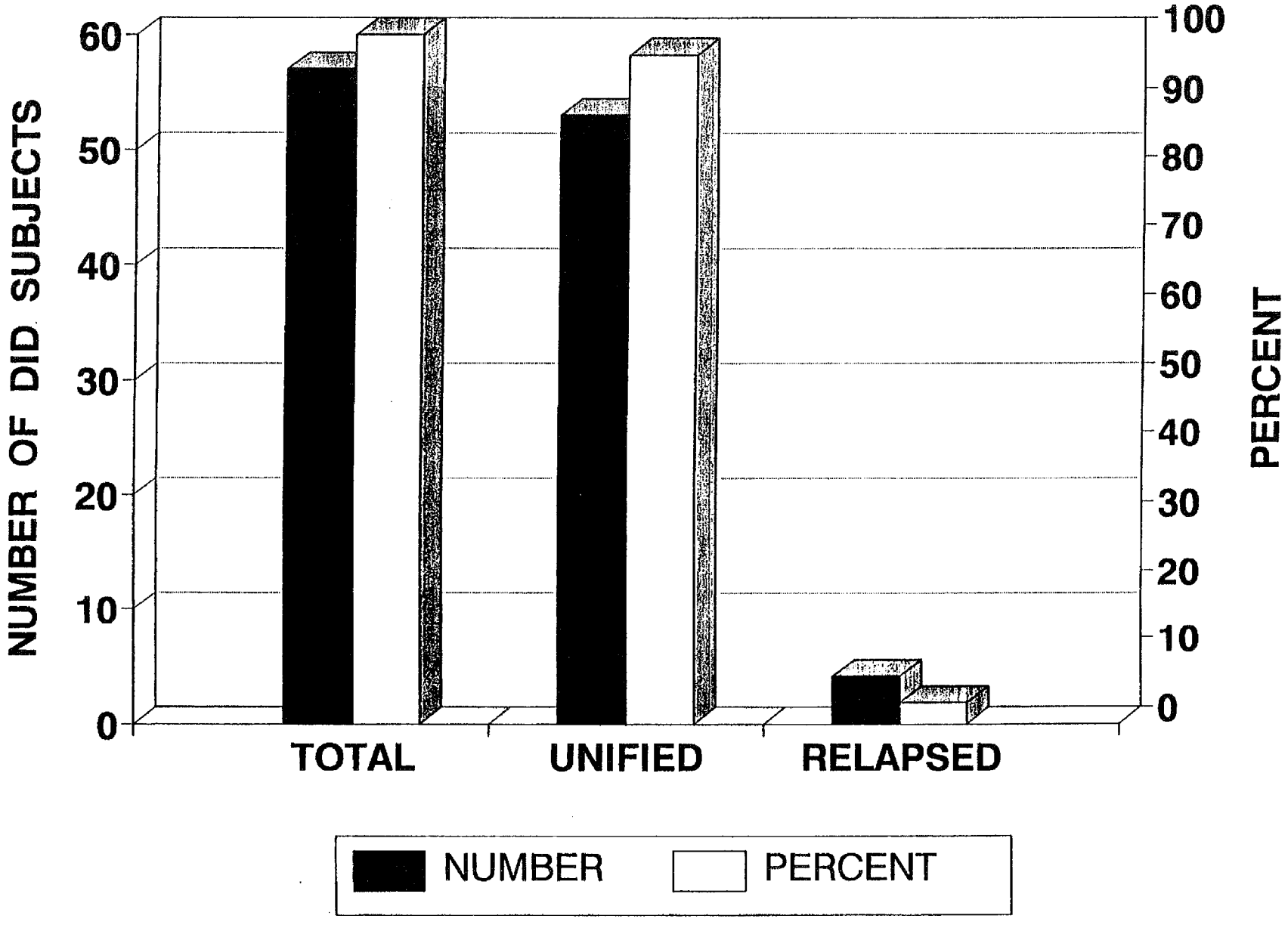
In summary, Armstrong and Lowenstein (1990) reported that treatment models for this disorder that focused on eliciting and working with state changes that occur naturally permit better access to patient's health and adaptiveness. Neurofeedback teaches patient's to learn to recognize, feel and regulate states of arousal. It enables them to synthesize into conscious awareness the dissociated knowledge, affect, sensations and behaviors that allow their continuous consciousness to emerge and to re-associate these experiences in the present, thus having more flexibility of choice. Recent research studies have shown that unconscious processes influence emotional reactions and affect judgement (Freiberg & Meirkle, 1993). The treatment enabled the subjects to consciously perceive their trauma and use the information to direct their activities and behavior. All unified subjects have reported that previous therapeutic experiences in which they were addressed and treated as if they had separate personalities exacerbated their condition and prolonged the recovery process by enabling them to continue to use dissociation to cope with both internal and external conflicts in the here and now. It was their predilection for isolation, dissociation, and self-defeating acts which made it difficult for them to relate to people and cope with life in a rational manner.

The subjects in this study were able to resolve the conflicts that were maintaining their dissociative defense symptoms. All subjects were free of their Post Traumatic Stress symptoms after 30 neurofeedback and 10 group sessions, and able to maintain these changes over time. This is in contrast to the normally 6-7 years of mental health contact normally spent in treating DID. The procedure described in this study allowed the DID subjects to rapidly coalesce their separate personalities and pursue basic psychotherapy as a unified person, thus significantly shortening treatment time. It is concluded that the administration of protocols which train the dissociative patient to control brainwave activity, combined with verbal self-exploration of the content of each neurofeedback session, enabled the subject to reassociate and reorganize their own experiences without intrusion by the therapist and bring about unification in a short period of time.

Achieving unification allowed the subjects to gain access to their psychological resources in a manner that allowed them to form and direct their emotional and behavioral responses in a rational manner, which prevented relapse into their dissociative defense system.

Present results support the need for empirically controlled research studies with large sample sizes and a control group to confirm these findings. The senior author has employed these methods to treat 57 patients who met the DSM-III-R and DSM-IV criterion for DID over a period of 5 years. All 57 patients were successfully treated using unification as a criterion of success. As shown in figure 3, 4, or 7% of the patients relapsed. One patient relapsed within the first three months and the other

TREATMENT RESULTS



three were unable to unify. The other 53, or 97% of the patients treated, remain unified, with the period of post treatment ranging from 2 to 13 months.

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FIGURE LEGENDS

Figure 1. Changes in global assessment of functioning scores of 11 subjects assessed BEFORE and AFTER 30 neurofeedback training and 10 group sessions. Values are means and standard deviations ($p < 0.05$).

Figure 2. Comparison of group mean MCMI-II scores of subjects tested before treatment (PRE) and following 30 neurofeedback training and 10 group sessions (POST). Only the categories marked were statistically significantly different between the groups.
* = $p < 0.05$, ** = $p < 0.02$, + = $p < 0.056$, ++ = $p < 0.071$

Figure 3. Summary graph of all DID patients treated using Neurofeedback procedures during a 5 year period. The number of values based on a total of 57 patients treated are given as shaded bars.

Carol F. Manchester, Ph.D. has been in private practice for nearly 20 years. Over the past decade, she has been a pioneer in the use of neurofeedback for treating Dissociative Identity Disorder. Dr. Manchester continues to successfully utilize this procedure with DID patients. Currently she is participating with Interact/Mount Carmel Behavioral Healthcare, a large regional managed behavioral health/EAP provider, to develop and utilize outcome measures and data to demonstrate to third party payors and employers the efficacy and cost-effectiveness of neurofeedback for a broader range of clinical applications.

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