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Measurement of Dissociative States with the Clinician-Administered Dissociative States Scale (CADSS)

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The purpose of this study was to develop an instrument for the measurement of present-state dissociative symptoms, the Clinician Administered Dissociative States Scale (CADSS). Reported here are interrater reliability and internal consistency of the CADSS, validity as assessed by comparisons with other instruments for the assessment of dissociation, and sensitivity of the CADSS to discriminate patients with dissociative disorders from patients with other psychiatric disorders and healthy subjects. Initial analyses indicated good interrater reliability and construct validity for the CADSS. Scores on the CADSS discriminated patients with dissociative disorders from the other groups.

KEY WORDS: dissociation; trauma; PTSD; psychometrics.

The past decade has seen a rapid expansion of research attempting to understand the symptoms of dissociation (Carlson & Rosser-Hogan, 1991;

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Chu & Dill, 1990; Loewenstein & Putnam, 1988; Ross, Joshi, & Currie, 1990; Spiegel & Cardeña, 1991). Dissociative states involve symptoms of gaps in memory not due to ordinary forgetting (amnesia), out of body experiences and other distortions of the sense of one's own body (depersonalization), distortions in visual perception, such as seeing things as if they are in a tunnel or seeing things in black and white (derealization), and fragmentation of the sense of the self (identity disturbance). Dissociative symptoms are often associated with exposure to traumatic stressors (Bremner et al., 1992; Koopman, Classen, & Spiegel, 1994; Marmar et al., 1994) and can be exacerbated by exposure to subsequent stressors (Bremner & Brett, 1996). Although studies have begun to examine the phenomenology and neurobiology of dissociation, this field is still in its infancy relative to other areas of behavior and mental health.

Systematic research in the field of dissociation has been limited until recently by the absence of a reliable and valid instrument for the measurement of dissociative states. Instruments for the measurement of other behavioral states, such as depressive and anxiety states, have long been available (Goodman et al., 1989; Hamilton, 1960; Hamilton, 1967; Mazure, Nelson, & Price, 1986). Instruments for diagnosis of dissociative disorders and for the measurement of general symptom levels have been developed, including the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1988), Structured Clinical Interview for DSMIIIR-Dissociative Disorders (SCID-D; Steinberg, Rounsaville, & Cicchetti, 1990), and Dissociative Disorders Interview Schedule (DDIS; Ross, Joshie, & Currie, 1990). These instruments, however, do not assess dissociative states, and they cannot be used as repeated measures. State measures are necessary for a comprehensive assessment of the construct of dissociation (Bremner et al., 1992; Marmar et al., 1994). They are useful for measuring changes in symptoms, and can be applied, for example, to psychotherapy or treatment trials. In the current study, we report on the reliability and validity of a standardized measure of present-state dissociative symptomatology, the Clinician Administered Dissociative States Scale (CADSS).

Method

Subjects

Subjects in this study included patients with combat-related posttraumatic stress disorder (PTSD) and high levels of dissociative disorder comorbidity (PTSD/dissociative) (n = 68). Thirty out of 35 (86%) of the PTSD patients who were assessed with the Structured Clinical Interview for DSM-III-R-Dissociative Disorders (SCID-D; Steinberg et al., 1990) had

at least one comorbid dissociative disorder. Ten out of 35 (29%) of the PTSD patients had comorbid amnesia, 14/35 (40%) comorbid depersonalization, 1/35 (3%) dissociative identity disorder (DID), and 8/35 (23%) dissociative disorder NOS. Subjects in the study also included patients with the diagnoses of schizophrenia (n = 22), and affective disorders (n = 15), Vietnam combat veterans without PTSD or dissociative disorders (n = 11) and normal healthy controls (n = 8). Diagnoses in the patient groups were based on the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, & Gibbon, 1987) or the diagnosis of a research psychiatrist based on DSM-III-R criteria (American Psychiatric Association [APA], 1987). All dissociative disorder diagnoses were based on a structured interview performed with the SCID-D (Steinberg et al., 1990).

All psychiatric patients were admissions to the West Haven VA Medical Center over a 1-year period. PTSD/dissociative disorder patients were admitted to the inpatient unit of the National Center for PTSD, affective disorders patients were admitted to the inpatient and outpatient units of the affective disorders program, and schizophrenic patients were admitted to the inpatient unit of the Schizophrenia Biological Research Center. Vietnam veterans without PTSD were admissions to an outpatient VA medical clinic. Healthy controls were recruited through advertisement. Healthy controls and Vietnam veterans without PTSD underwent a psychiatric diagnostic interview and subjects with a psychiatric disorder were excluded. All subjects provided written informed consent for participation.

There was a significant difference in age between the different patient and subject groups in this study as measured by one-way ANOVA, F = 11.76; df = 4,119; $p < .001$. Duncans multiple range test showed that controls were younger (M = 30.6 years of age, SD= 9.9) than the other groups, including combat controls (M = 48.8, SD = 4.7), PTSD/dissociative disorder patients (M = 46.6, SD = 2.8), schizophrenia patients (M = 45.1, SD = 10.8), and affective disorders patients (M = 48.5, SD = 10.1). The distribution of race in the groups was as follows: healthy controls (100% White), combat controls (91% White, 9% Black), and patients with PTSD (87% White, 12% Black, 1% Hispanic), schizophrenia (64% White, 36% Black), and affective disorders (73% White, 20% Black, 7% Hispanic). All subjects who participated in this study were men except for 3 of the 15 affective disorder subjects (80% male, 20% female) and 2 of the 21 schizophrenic subjects (91% male, 9% female).

Instruments

Development of the CADSS. The Clinician-Administered Dissociative States Scale (CADSS) was developed following a review of the literature

on dissociative symptomatology (Branscombe, 1991; Cardeña & Spiegel, 1989; Carlson & Rosser-Hogan, 1991; Janet, 1889; Koopman et al., 1994; Loewenstein & Putnam, 1991; Nemiah, 1989; Putnam, 1989; Spiegel, Hunt, & Dondershine, 1988; van der Kolk & van der Hart, 1989). Field trials were performed over a several year period with a preliminary version of the instrument, before the final version of the CADSS was developed.

The CADSS is a 27-item scale with 19 subject-rated items and 8 items scored by an observer. The subjective component consists of 19 items which are administered by a clinician who begins each question with the phrase "at this time" and then reads the item to the subject (Table 1). The subject then endorses one of a range of possible responses: 0 = not at all, 1 = slightly, 2 = moderately, 3 = considerably, 4 = extremely. The subject's response on this 0 to 4 scale is recorded and the clinician moves on to the next item. The observer component consists of eight behavioral items which have been noted in the clinical literature as behaviors consistent with the presence of a dissociative state (Bliss, 1986; Braun, 1984; Kluft, 1984; Putnam, Guroff, Silberman, Barban, & Post, 1986; Spiegel & Cardeña, 1991; Spiegel et al., 1988; van der Kolk, 1987). The clinician observes the behavior of the subject during the administration of the subjective items and makes a judgment about the degree to which the subject's behavior fits the description of that particular item, using the 0 to 4 rating scale as described above. Subscales of the CADSS for the assessment of individual symptom areas were developed based on a priori hypotheses for amnesia (items 14, 15), depersonalization (items 3–7), and derealization (items 1, 2, 8–13, 16–19).

Instruments for the assessment of validity. Other instruments used for the assessment of dissociation were utilized for the assessment of validity in this study. The Dissociative Experiences Scale (DES) is an established instrument for the measurement of dissociative symptomatology (Bernstein & Putnam, 1986) with established reliability and validity. The SCID for Dissociative Disorders (SCID-D) is a comprehensive instrument with established reliability and validity for the assessment of dissociative disorder diagnoses and level of symptom severity (Steinberg et al., 1990). The SCID-D contains subscales for the assessment of amnesia, depersonalization, and derealization, as well as sum scores for assessment of dissociative symptomatology.

Procedure

All raters who administered the CADSS were trained in the administration of this instrument by the first author. Studies of reliability and validity were then performed as follows:

Reliability. In order to assess the interrater reliability of the CADSS, we measured agreement between two raters blind to the other's ratings.

First, the interviewers were trained to recognize and assess dissociative symptomatology. Individual items were reviewed with the interviewer and questions clarified about the instrument. Several practice interviews were performed with the interviewers. Then, raters performed independent videotaped interviews in 16 subjects including patients with PTSD/dissociative disorders, schizophrenia, depression, panic disorder, and healthy controls. Raters then "cross-rated" the other rater's videotaped interview.

Studies of test-retest reliability were not performed, as the CADSS is an instrument for the measurement of change, and dissociative states are not expected to remain constant over time.

Tests of internal consistency were determined from the data obtained in 68 subjects with PTSD and high levels of dissociative disorders by using Cronbach's (1951) alpha coefficient and by measuring the correlation of individual items with the total score minus that particular item.

Construct validity. We assessed the construct validity of the CADSS by measuring the correlation of the total score on the CADSS with the score on the DES in 51 patients with PTSD. Although the DES is not a measure of dissociative states, at the time of this study it was the only available instrument for the measurement of dissociative symptoms with established reliability and validity. Also, since the DES in effect measures the average of dissociative states over a long period of time, one would expect some correlation with a measure of dissociative states. We also assessed the validity of the amnesia, depersonalization, and derealization subscales of the CADSS by measuring the correlation of these subscales with corresponding subscales of the SCID-D in 35 patients with PTSD/dissociative disorders (Steinberg et al., 1990).

In order to assess the validity of the CADSS for detection of changes in dissociative states over time (i.e., its use as a repeated measure), we administered the CADSS to a subgroup (n = 39) of the PTSD/dissociative patients before and after exposure to a traumatic memories group. The format of the group consisted of patients writing a story, letter, or poem about one of the five most traumatic events which occurred during their military service, and reading it out loud in front of a group of other patients. Patients were administered the CADSS after the group and asked to relate their responses to how they felt during the group.

Results

Interrater Reliability

There was a high level of agreement between two raters for interrater reliability, with an intraclass correlation coefficient (ICC) (Bartko, 1961) of .92, $F = 16.3$; $df = 15,16$; $p < .01$, for the total score, and ICC of .99,

$F = 99.0$; $df = 15,16$; $p < .001$, for the subject-rated subscale. There was a more modest level of agreement, ICC = .34, $F = 1.36$; $df = 15,16$; $p < .05$, for the observer rated component.

Internal Consistency

The CADSS also showed high internal consistency across all items ($N = 124$; coefficient alpha = .94) (Cronbach, 1951), suggesting that individual items were generally measuring the same construct. Alpha coefficients were also performed for the: (1) subjective subscale; (2) observer subscale, and; (3) symptom subscales (amnesia, depersonalization and derealization). Coefficient alpha for the subjective ratings was .94, while for the observer ratings it was .90. Coefficient alpha values for the subjective subscales based on individual symptom areas of dissociation were .74 for amnesia, .82 for depersonalization, and .90 for derealization.

We investigated the correlation of each item to the total score minus that item. Within the PTSD/dissociative disorders patient group, all subjective items were frequently endorsed (Table I). There was a strong relationship between all 19 subjective items and the total scale score, with significant correlations between each of these items and the total scale score minus that item after adjustment for multiple comparisons ($p < .002$). Observer-rated items were in general endorsed less frequently than subjective item. Observer items that were endorsed by less than 5% of the patients included items 23, 24, 26, and 27. When the frequency with which items were endorsed at a level of slightly or greater was investigated, the most frequently endorsed item by PTSD patients at baseline were items 15, 16, and 17 (Table 1).

Validity

The correlation between the total baseline score on the CADSS and the score on the DES was $r = .48$ ($df = 49$; $p < .001$). Total score on the SCID-D (sum of depersonalization, derealization, and amnesia subscales) was correlated with score on the CADSS, $r(40) = .42$, $p = .005$. However, scores on the individual depersonalization, derealization, and amnesia subscales of the CADSS were not significantly correlated with the corresponding subscales of the SCID-D.

PTSD patients with high dissociative disorder comorbidity were compared to other patient groups and control subjects. Scores on the CADSS were significantly different for patients with PTSD ($M = 18.9$, $SD = 118.3$) versus patients with schizophrenia ($M = 3.7$, $SD = 5.2$), affective disorders

Table 1. Correlation of Individual Items with Total Score and Frequency of Endorsement of Items on the CADSS in PTSD/Dissociative Disorder Patients at Base (N = 68)

	r	No. Endorsed[a] (%)
Subjective Items		
(At this time, in this room)		
1. Do things seem to be moving in slow motion?	.55***	33 (48%)
2. Do things seem to be unreal to you, as if you are in a dream?	.70***	28 (41%)
3. Do you have some experience that separates you from what is happening; for instance, do you feel as if you are in a movie or a play, or as if you are a robot?	.61***	32 (47%)
4. Do you feel as if you are looking at things from outside of your body?	.77***	24 (35%)
5. Do you feel as if you are watching the situation as an observer or spectator?	.53***	36 (53%)
6. Do you feel disconnected from your own body?	.57***	24 (35%)
7. Does your sense of your own body feel changed: for instance, does your own body feel unusually large or unusually small?	.61***	20 (29%)
8. Do people seem motionless, dead, or mechanical?	.62***	23 (34%)
9. Do objects look different than you would expect?	.71***	15 (22%)
10. Do colors seem to be diminished in intensity?	.71***	23 (34%)
11. Do you see things as if you were in a tunnel, or looking through a wide angle photographic lense?	.81***	28 (41%)
12. Does this experience seem to take much longer than you would have expected?	.49***	29 (43%)
13. Do things seem to be happening very quickly, as if there is a lifetime in a moment?	.61***	21 (31%)
14. Do things happen that you later cannot account for?	.85***	22 (32%)
15. Do you space out, or in some other way lose track of what is going on?	.74***	37 (54%)
16. Do sounds almost disappear or become much stronger than you would have expected?	.71***	33 (48%)
17. Do things seem to be very real, as if there is a special sense of clarity?	.45***	34 (50%)
18. Does it seem as if you are looking at the world through a fog, so that people and objects appear far away or unclear?	.74***	25 (37%)
19. Do colors seem much brighter than you would have expected?	.61***	18 (26%)
Observer Items		
20. Did the subject seem eery or strange, or in some other way give you an uncomfortable feeling?	.52***	17 (25%)
21. Did the subject blank out or space out, or in some other way appear to have lost track of what was going on?	.59***	20 (29%)
22. Did the subject appear to be separated or detached from what is going on, as if not a part of the experience or not responding in a way that you would expect?	.54***	23 (34%)
23. Did the subject say something bizarre or out of context, or not speak when you would have expected it?	.25*	8 (12%)
24. Did the subject behave in a bizarre, unexpected manner, or show no movement at all, being stiff and wooden?	.35**	7 (10%)

Table 1 (Continued)

	r	No. Endorsed[a] (%)
25. Did the subject have to be put back on track, or grounded in the here and now, during or soon after the experience?	.38***	8 (12%)
26. Did the subject show any unusual twitching or grimacing in the facial musculature?	.09	2 (3%)
27. Did the subject show any unusual rolling of the eyes upward or fluttering of the eyelids?	.10	2 (3%)

[a]Number (%) of subjects who endorsed that item as being moderate in severity or greater.
*$p < .05$.
**$p < .01$.
***$p < .002$ (significant with adjustment for multiple comparisons); $df = 66$ for all items.

($M = 7.5$, $SD = 9.6$), as well as healthy controls ($M = 1.5$, $SD = 2.5$) and Vietnam combat veterans without PTSD ($M = 1.3$, $SD = 3.9$) ($F = 8.25$; $df = 4,119$; $p < .001$), as determined with one-way analysis of variance and Duncan's multiple range test. PTSD patients with comorbid dissociative disorders had higher CADSS scores than those without comorbid dissociative disorders ($M = 19.3$, $SD = 18.7$ vs $M = 14.8$, $SD = 16.9$), although primarily due to the small number of patients in the nondissociative disorder category these differences were not statistically significant.

A subgroup ($n = 39$) of patients with PTSD were assessed before and after exposure to a traumatic memories group. They showed a significant increase in dissociative symptomatology in comparison to baseline, post-traumatic memories group: $M = 35.0$, $SD = 21.9$ vs. pre-traumatic memories group ($M = 21.8$, $SD = 18.8$), paired t-test: $t(37) = 4.03$, $p < .001$.

Discussion

Our findings suggest that the CADSS is a reliable and valid instrument for the measurement of present-state dissociative symptomatology. In the current study, the CADSS was shown to have a high level of agreement between different raters, as well as a high degree of internal consistency, which suggests that the individual items have a high level of agreement with one another. The CADSS was shown to be valid in the measurement of the construct of dissociation as measured by the relationship between CADSS scores and scores on the most commonly utilized measure of dissociation, the DES. The CADSS was also shown to have a high level of sensitivity in its ability to discriminate patients with PTSD and comorbid dissociative disorders (in 86% of cases) from patients with schizophrenia

and affective disorders, as well as normal healthy controls and Vietnam combat veterans without PTSD.

The CADSS was sensitive to change in dissociative symptomatology in PTSD/dissociative patients before and after a traumatic memories group. This suggests that the CADSS can be used as a repeated measure which assesses symptomatology at specific time points. The CADSS may be of particular utility in biological and psychopharmacological studies (Krystal et al., 1994) which require a repeated measure of present-state symptomatology which can be administered easily and efficiently.

Our findings do not support the current nosology of individual symptom areas of dissociation. Internal consistency of the scale was higher for the total scale score than for the individual subscales of amnesia, depersonalization, and derealization. In addition, the subscales of depersonalization, derealization and amnesia did not correlate with corresponding subscales of the SCID-D, although we did find a high level of agreement between total CADSS score and total SCID-D symptom score. This suggests that the subscales are not particularly useful in the differentiation of subtypes of patients with dissociative symptoms. We are not aware of other studies, however, which have established the construct validity of these symptom areas. Our previous studies found that these symptom areas were highly correlated with one another (Bremner, Steinberg, Southwick, Johnson, & Charney, 1993). In the current sample of patients, dissociative symptoms tended to aggregate together. For instance, patients reported episodes of losing periods of time (amnesia). Immediately before or after these episodes they remembered the feeling that things around them were unreal, or that they felt like they were in a dream (derealization). Again, many of the patients who reported out-of-body experiences (depersonalization) said that during the experience they felt as if they were in a dream or as if colors had changed (derealization). Future studies should address the question of whether the individual symptom areas of dissociation have construct validity as separate entities apart from general dissociative symptomatology.

The CADSS showed only a modest level of correlation with the most commonly used scale for the measurement of dissociation, the DES (r = .48). This may be a reflection of the fact that the CADSS measures dissociative states, while the DES measures general dissociative symptomatology. Also, there are some differences in the content of the items in the two instruments. The DES has items which reflect absorption as well as dissociation, while the CADSS is more specifically an instrument of dissociation. Also the CADSS is weighted more toward amnesia, derealization and depersonalization items, while the DES has more identity alteration items.

Some of the individual items which are part of the observer subscale did not correlate with total CADSS scale score. These included items 23,

24, 26, and 27 (Table 1). These items were included in the scale based on a review of the clinical literature, which suggested that they represent behaviors commonly seen in dissociative states. Future studies may be useful in determining whether the variables contained in these items are related to the construct of dissociation.

We also found only a modest level of agreement between raters on the observer ratings portion of the scale (ICC = .34). More extensive training of raters, or the use of specific anchors, may be needed in order to improve the reliability of this aspect of the scale. These items were included in the scale largely on the basis of a review of the literature related to multiple personality disorder (currently termed dissociative identity disorder (DID)). It may be that observable dissociative behaviors are primarily seen in patients with DID. Reliability studies in a concentrated population of patients with DID would be useful to determine if this is the case. It also may be possible that observable dissociative behaviors do not represent a viable construct, and that dissociation is essentially a subjective phenomenon. It is premature, however, to draw conclusions about the viability of dissociative behavior as a construct merely on the basis of these preliminary findings. Future studies are needed to investigate this important question.

Our findings should be considered preliminary for several reasons. More extensive testing of reliability and validity in a larger number of subjects would be beneficial. Testing in different populations, such as dissociative populations with larger numbers of DID patients, and in other settings, such as a repeated measure in a treatment trial for dissociative symptomatology. There were also methodological limitations of the study, such as the fact the healthy controls were younger as a group than the patients. This should not represent a confound to our finding of increased dissociative symptomatology in the patient group, however, since dissociative symptomatology measured with the DES has previously been shown to decrease with age (Ross et al., 1990).

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