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Endorsement of Dysfunctional Beliefs Depends on Current Mood State

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Abstract

In two studies we tested the hypothesis that endorsement of dysfunctional beliefs depends on current mood state for persons who are vulnerable to depression. The first study showed that reports of dysfunctional beliefs vary with spontaneous diurnal mood fluctuations in 47 depressed psychiatric patients. The effect of mood state was highly significant ($p < .01$); dysfunctional thinking increased when mood was worst and decreased when mood was best. The second study conceptually replicated this finding in a population of asymptomatic subjects. As predicted, reports of dysfunctional beliefs varied as a function of mood state in 14 persons who had experienced a depressive episode but not in 27 who had never been depressed. These findings support the cognitive theory of depression, which proposes that dysfunctional beliefs are vulnerability factors for depression but also that reporting of dysfunctional beliefs depends on current mood state.

Cognitive theories propose that underlying dysfunctional beliefs or attributions interact with life events to produce depres-sion (Abramson, Seligman, & Teasdale, 1978; Beck, 1972). However, empirical evidence has not supported the claim that these cognitions are vulnerability factors for depression. Lewinsohn, Steinmetz, Larson, and Franklin (1981) demonstrated that per-ons who later developed a clinical depression were no more likely to have previously exhibited dysfunctional thinking than were persons who did not become depressed. In addition, sev-eral comparisons of recovered depressives and controls failed to find the predicted differences in dysfunctional attitudes (Ha-milton & Abramson, 1983; Hollon, Kendall, & Lumry, 1986; Silverman, Silverman, & Eardley, 1984). Finally, several studies have shown that as depression remits, dysfunctional attitudes "remit" as well (Eaves & Rush, 1984; Hamilton & Abramson, 1983; Persons & Rao, 1985; Silverman et al., 1984; Simons, Gar-field, & Murphy, 1984). These three types of evidence are inconsistent with the proposal that dysfunctional beliefs are vulnerability factors for depression.

Miranda and Persons (1988) offered an elaboration of cognitive theory that accounts for these negative findings with regard to the role of dysfunctional beliefs as vulnerability factors for depression. In the mood-state hypothesis, they proposed that dysfunctional beliefs are vulnerability factors for depression but that reporting of the beliefs varies with current mood state. When vulnerable persons are in a negative mood state, they readily endorse dysfunctional beliefs, but when they are in a positive mood state, they do not report dysfunctional beliefs. Similar suggestions were made earlier by others, including Ingram (1984), Riskind and Rholes (1984), Segal (1988), Segal and Shaw (1986), and Teasdale (1983).

In an initial test of the mood-state hypothesis, Miranda and Persons (1988) studied a sample of asymptomatic women and showed that dysfunctional beliefs changed as a function of a mood manipulation. The first study reported in this article replicates and extends that finding by testing the hypothesis that underlying dysfunctional beliefs vary as a function of spontaneous diurnal mood fluctuations in depressed psychiatric patients. Because mood is assessed twice within 24 hr, we can examine the impact of mood on dysfunctional thinking while holding syndromal depression constant.

Miranda and Persons (1988) also showed that when subjects are in a negative mood, persons with a past history of depres-ion report more dysfunctional beliefs than persons without a history of depression. However, history of depression was assessed with a nonstandardized paper-and-pencil questionnaire. The second study that we report replicates and extends that finding by assessing mood and dysfunctional thinking in asymptomatic men and women whose history of depression was assessed with a highly structured, standardized interview.

Study I

In this study we tested the hypothesis that endorsement of dysfunctional beliefs is mood-state contingent in depressed psychiatric patients.

Method

Subjects. The subjects were 34 inpatients at Langley Porter Psychiatric Institute and 13 outpatients in the Depression Clinic at San Francisco General Hospital. All subjects were depressed according to chart diagnoses or Beck Depression Inventory (BDI; Beck, 1967) scores of! 5 or above. The mean age was 38.6 years (SD= I 1.8); 76.6% were women, 17 .0% were minorities, and 23.4% were married. The sample averaged 13. 7 years of education (SD = 3.0), and 26.0% were employed. The mean BDI for the sample was 24.6 (SD= 10.3).

Mood state. Twenty items of the Multiple Affect Adjective Check List (MAACL; Zuckerman & Lubin, 1965) were used to measure current mood state. We chose items that most closely measured sad, depressed mood (e.g, blue, sad, and miserable) or absence of sad,

and miserable) or absence of sad mood (e.g., fine, glad, and active). The subjects responded to each item on a 5-point scale from *Right now I feel very much like this* (l) to *Right now I feel not at all like this* (5). Coefficient alphas for the scale at the two testing times were .94 and .96, which reflect high internal consistency.

Dysfunctional thinking. The Dysfunctional Attitude Scale (DAS; Weissman, 1979; Weissman & Beck, 1978; see Hammen & Krantz, 1985, for review) was used to assess dysfunctional thinking. The scale consists of two equivalent 40-item questionnaires that measure (on 7-point scales) subjects' agreement with items that assess dysfunctional thoughts such as perfectionistic performance standards, rigid ideas about the world, and concern about the judgments of others. Sample items are: "My value as a person relies greatly on what others think of me," "If I fail at work then I'm a failure as a person," and "People should be criticized for their mistakes." The DAS shows good internal consistency, with alphas that range from .89 to .93, and stability over time, with test-retest reliabilities from .71 to .84 (Hamilton & Abram-son, 1983; O'Hara, Rehm, & Campbell, 1982; Weissman, 1979).

Procedure. The subjects identified the time of day of their best and worst mood, and they completed questionnaires at these two times during a 24-hr period. Order of mood (best-worst) and order of forms of the DAS (A-8) were randomly assigned.

Results

Mean scores for all subjects on measures of mood state and dysfunctional attitudes are presented in Table 1.

Changes in mood. In order to determine whether subjects actually experienced the expected mood fluctuations, a repeated measures analysis of variance was computed with mood ratings at the time of day (best-worst) as the repeated dependent measure and order (best-worst vs. worst-best) as the independent variable. As predicted, the repeated measure, best or worst time of day, was statistically significant, $F(1, 47) = 38.1$, $p < .001$. As shown in Table l, mood was better at the best time of day as compared with the worst time of day. There was no order effect.

Changes in dysfunctional thinking as a function of mood. In order to test the hypothesis that endorsement of dysfunctional attitudes varies as a function of mood, a repeated measures analysis of variance was computed with DAS at the time of day (best mood-worst mood) as the repeated dependent measure. Independent factors were order (best-worst vs. worst-best) and order of DAS Forms A and B. As predicted, the repeated measure was statistically significant, $F(l, 47) = 20.2$, $p < .001$. As shown in Table 1, thinking was more dysfunctional when mood was worst and less dysfunctional when mood was best. There were no other statistically significant main effects or interac-tions, which suggests that the results were similar across both groups.

Study 2

We tested the hypothesis that when subjects are in a negative mood state, those with a past history of depression report more dysfunctional beliefs than those without a past history of de-pression.

Method

Subjects. The 41 subjects were selected from participants in the Depression Prevention Research Project (DPRP; Munoz, Ying, Armas, Chan, & Gurza, 1987). DPRP participants were recruited from two medical clinics at the University of California, San Francisco, and met the following criteria: (a) aged 18-69; (b) medical chart open for at least 6 months; (c) literate in English or Spanish; (d) no terminal illness; and (e) no current mental health treatment. The subjects in our study consisted of DPRP subjects who participated in the 4-year follow-up interview and who met two additional criteria: (a) not currently depressed; and (b) attendance at the clinic with predominantly English-speaking patients. Twelve subjects were excluded either because they were currently or recently depressed, as indicated by BDI scores greater than 15 (n = 6), or because they met the criteria for a major depressive episode within the past 4 months (n = 6).

The subjects in the present study had a mean age of 52.3 years (SD= 12.9); 51.2% were women, and 34.0% were married. They had a mean of 14.4 (SD= 3.3) years of education. Approximately half of the sub-jects were employed; 72.5% were White, 12.5% Black, and 5% each Asians, Latinos, and other ethnicities. The subjects had a mean BDI score of 6.3 (SD= 4.7).

Mood state and dysfunctional thinking. The same measures were used as in Study I. Twenty items from the MAACL (Zuckerman & Lubin, 1965) measured mood state with a coefficient alpha of .95. We used Form A of the DAS (Weissman, 1979; Weissman & Beck, 1978).

History of depression. The Diagnostic Interview Schedule (DIS; Ro-bins, Helzer, Croughan, & Ratcliff, 1981) determined whether subjects had met Diagnostic and Statistical Manual of Mental Disorders (DSM-/JI; American Psychiatric Association, 1980) criteria for major depression or dysthymia at any time during their life. The DIS provides a highly structured interview for psychiatric assessment according to DSM-III criteria and can be given by lay interviewers.

Procedure. The measures for our study were given as part of the DPRP. Two sessions were required to collect the data for both studies; the DIS was given in the first session, and the questionnaires for our study in the second. Interviews were done at the University of California, San Francisco, outpatient medical department by research assistants trained to administer the DIS.

Results

Fourteen subjects (34. l %) reported a previous episode of depression, and 27 (65.9%) did not. Mean BDI was 6.7 (SD= 4.9) for the previously depressed group and 6.0 (SD= 4.7) for the never depressed group.

To test the hypothesis that endorsement of dysfunctional beliefs depends on current mood for persons who have a history of depression, we performed a multiple regression analysis to predict DAS scores with history of depression, current mood, and

the interaction of History of Depression X Current Mood. History of depression was entered first (R^2 = .02, p .34) followed by current mood (R^2 = .11, p = .1 1). In order to determine whether reports of dysfunctional beliefs depend on current mood only for persons with a past history of depression, the History of Depression x Current Mood interaction was entered into the equation last (R^2 = .24, p = .02). As predicted, this interaction was statistically significant, t(40) = 6.4, p = .02. Figure 1 shows the scatter plot and estimated regression lines for the relation between dysfunctional thinking (DAS) and current mood state (MAACL items) for subjects with and without a history of depression. The figure shows that differences between the two groups are not apparent when subjects are in a good mood state but become apparent as mood state becomes increasingly negative.

As can be seen in Figure 1, these results are based on a smalJ number of subjects, three of which are outliers: the subjects with a history of depression who scored 176 and 152 on the DAS and 66 and 34 on the MAACL, and the one with no history who scored 111 and 71, respectively. In order to determine whether these results were reliable, the multiple regression analysis to predict DAS scores with history of depression, current mood, and the interaction of History of Depression X Current Mood were repeated with these three subjects omitted. Again, the History of Depression x Current Mood interaction was entered into the equation last and was statistically significant, t(37) = 4.5, p = .04. Furthermore, the zero-order correlation between the DAS and current mood was significant for those with a history of depression (n = 12, r = .62, p = .03) and nonsignificant for those without a history of depression (n = 26, r = -.08, p = .66). Dysfunctional thinking increases as negative mood state increases for those with a history of depression; in contrast, dysfunctional thinking is unrelated to mood state in those who have never been depressed.

Discussion

The results of these two studies support the mood-state hypothesis that reporting of dysfunctional beliefs by persons who are vulnerable to depression depends on mood. In the first study, depressed psychiatric patients reported changes in dysfunctional attitudes as a function of spontaneous, diurnal mood changes; as their mood became more negative, they reported more dysfunctional beliefs. In the second study, asymptomatic subjects reported their mood and dysfunctional thinking. As predicted, in subjects who were vulnerable to depression, re-ports of dysfunctional attitudes varied with mood. For subjects who were not vulnerable to depression, reports of dysfunctional attitudes were unrelated to mood .

The mood-state hypothesis has important implications for cognitive theories of depression (Persons & Miranda, 1989). The hypothesis accounts for evidence usually viewed as damag-ing to the theories, specifically that dysfunctional beliefs do not distinguish persons who will become depressed later from those that will not (Lewinsohn et al., 1981) or recovered depressives from normals (e.g., Hamilton & Abramson, 1983). Simi-larl the hypothesis accounts for evidence that dysfunctional beliefs remit as depressive symptoms remit (e.g., Eaves & Rush, 1984). The mood-state hypothesis predicts that those who will later develop a depression or who have been depressed but are not currently depressed do in fact have more dysfunctional atti-tudes than less vulnerable persons, but the differences are evident only when subjects are in a negative mood. Simil dysfunctional beliefs appear to remit as depressive symptoms remit because these cognitions are activated only when the formerly depressed patient is dysphoric.

The finding that dysfunctional beliefs emeige only in the presence of a negative mood may appear to argue against the view that dysfunctional beliefs serve as vulnerability factors for depressive episodes. However, drawing a distinction between negative mood and syndrome depression helps clarify this issue. For example, according to the mood-state hypothesis, vulnerable persons who are experiencing a negative mood state, for whatever reason, are more likely to recall and report dysfunctional beliefs. Activation of dysfunctional beliefs may then precipitate a clinical depression.

These findings for depression may also apply to anxiety and other moods. That is, we expect that reporting of dysfunctional beliefs that predispose persons to anxiety and anxiety disorders is facilitated by the presence of an anxious mood state. The cognitive account of anxiety (Beck, Emery, & Greenberg, 1985), psychological models of fear (Lang, l 977), and an information-processing model of the process of successful treatment offear (Foa & Kozak, 1986) support this notion, but empirical evi-dence is lacking.

The mood-state hypothesis has important implications for causal mediational models of cognitive therapy. Outcome stud-ies have found that changes in dysfunctional beliefs appear to occur during treatment of depression regardless of the type of intervention (Rush, Beck, Kovacs, Weissenburger, & Hollon, 1982; Simons et al., 1984; Zeiss, Lewinsohn, & Munoz, 1979). This finding is not consistent with the proposed mechanism of action of cognitive therapy, which hypothesizes that patients treated with cognitive therapy experience greater cognitive changes than patients treated with other modalities. The mood-state hypothesis suggests that the apparent remission of dysfunctional beliefs in patients treated with noncognitive therapies is due to the fact that patients are tested at the end of treatment, when depression has usually remitted and mood is generally positive. Even if patients still hold dysfunctional beliefs, they are not experiencing a negative mood state and are unable to report them. We predict, however, that if patients were tested after a negative mood induction, those treated with cognitive therapy would show reductions in dysfunctional be-liefs due to treatment but those treated with noncognitive mo-dalities would not.

Finally, the mood-state hypothesis has important implications for cognitive therapists who are working to correct dys-functional attitudes in their depressed patients (Persons & Mi-randa, in press). The hypothesis suggests that assessment (and perhaps treatment) of dysfunctional beliefs is best done early in treatment, when mood is depressed and the patient can easily report dysfunctional beliefs.

Although our studies examined the cognitive vulnerability factors described by Beck's (1972) cognitive theory of depression, we expect that the mood-state hypothesis may also apply to attributions, the cognitive vulnerability factors described in the learned helplessness theory (Abramson et al., 1978) and in the hopelessness theory of depression (Abramson, Metalsky, & Alloy,

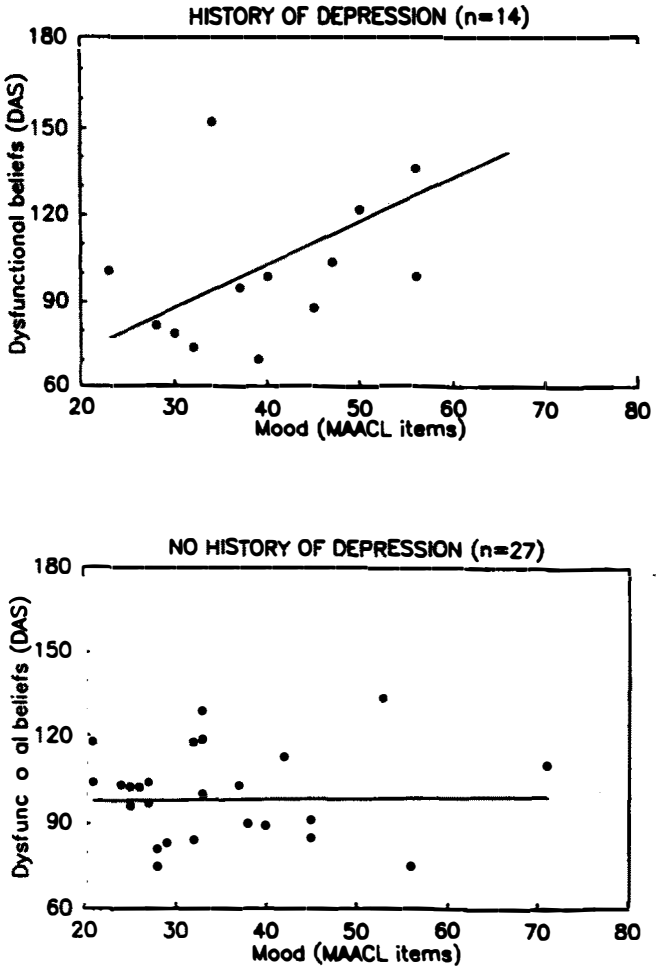
Table l

Means and Standard Deviations on the Multiple Affect Adjective Check List (MAACL) Items and the Dysfunctional Attitude Scale (DAS) During Best and Worst Mood

	Best mood		Worst mood	
Measure	*M*	*SD*	*M*	*SD*
	64.7	17.6	80.7	13.8
	132.8	34.7	147.9	38.5

Note. For the MA ACL, higher scores reflect more negative mood. For the DAS, higher scores indicate more dysfunctional thinking.

Figure 1. Scatter plots and estimated regression lines for the relation of dysfunctional beliefs (measured on the Dysfunctional Attitude Scale; DAS) to current mood state (measured with items on the Multiple Affect Adjective Check List; MAACL) in subjects who reported a history of depression with those who had never been depressed.



1989). Interestingly, a negative mood induction was not found to produce changes in attribution style in non-depressed undergraduates (Mukherji, Abramson, & Martin, 1982), but the hypothesis has not been tested in a sample of subjects known to be vulnerable to depression.

The data presented in our studies have several limitations. Most important, we have not demonstrated that dysfunctional beliefs are vulnerability factors for depression. We selected subjects vulnerable to depression by restricting the sample to persons who had experienced a depressive episode. Our findings may reflect the consequence of having had a depressive episode rather than the existence of a vulnerability factor for future episodes. A direct test of the hypothesis that persons who are vulnerable to depression endorse more dysfunctional beliefs (when in a negative mood) than do persons who are not vulnerable to depression requires a prospective study. Also, we have not provided any evidence about the nature of the cognitive mechanisms that produced the results. Mood-state dependent recall, mood-state congruent recall, or other mechanisms may be involved (Bower, 1981; Blaney, 1986; John-son & Tversky, 1983; Singer & Salovey, 1988). Furthermore, the subjects who were in a good mood in these studies not only failed to report dysfunctional beliefs but actually denied having them. This effect is reminiscent of other research (Bower, 1981; Kihlstrom, 1987; Nisbett & Wilson, 1977) that has demon-strated that cognitive contents and processes are not always available for inspection.

Finally, our samples are small; replications in larger samples are needed. Studies of college students that did not control for current depression or vulnerability have found relations between dysfunctional beliefs and mood (Gotlib, 1984; Weiss-man, 1979); in contrast, we found dysfunctional beliefs and mood were related in the vulnerable but not in the nonvulnerable group. Because of the importance of the mood-state hypothesis to cognitive theories and treatments of depression, these results must be replicated in larger samples.

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