Dysfunctional Attitudes and Episodes of Major Depression: Predictive Validity and Temporal Stability in Never-Depressed, Depressed, and Recovered Women

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In a large, community-based sample of women (N = 750), the authors examined the nature of associations between dysfunctional attitudes and depression. Dysfunctional attitudes were evaluated both as a vulnerability factor for depression and as a consequence of depression. A link was found between past depression and baseline elevations in dysfunctional attitudes that was independent of current subsyndromal symptoms, but intensification of dysfunctional attitudes following prospectively evaluated episodes of depression (depressive "scarring") was not observed. Although baseline dysfunctional attitudes predicted an episode of major depression over 3 years of prospective study, this prediction, considered alone or in interaction with negative life events, was redundant with that offered by history of past depression. Further, no significant prediction was evident for the Dysfunctional Attitude Scale (A. N. Weissman & A. T. Beck, 1978) when the formerly depressed and never-depressed cohorts were considered separately. Implications for cognitive theories are discussed.

Keywords: depression, dysfunctional attitudes, cognitive vulnerability, depressive scarring

The presence of high levels of dysfunctional attitudes, often assessed with the Dysfunctional Attitude Scale (DAS; A. N. Weissman & Beck, 1978), has been repeatedly associated with the presence and severity of depression (Dent & Teasdale, 1988; Dohr, Rush, & Bernstein, 1989; Norman, Miller, & Dow, 1988; Norman, Miller, & Keitner, 1987; Wise & Barnes, 1986). This association has been used to support early cognitive theories of depression, which emphasize the role of dysfunctional attitudes and negative thinking patterns as a relatively stable cognitive vulnerability that predisposes individuals to depression (Beck, 1967, 1976; Haaga, Dyck & Ernst, 1991). In "vulnerability" models, maladaptive thinking is thought to play both a causal and maintaining role in depression.

However, examination of this putative vulnerability factor is made more difficult by the apparent strong effects of mood state (i.e., presence of depressive symptoms) on dysfunctional attitudes. For example, successful treatment of depression with either pharmacological or psychosocial interventions results in significant decreases in dysfunctional attitudes, often to levels similar to those of nondepressed controls (Dohr et al., 1989; M. Fava, Bless, Otto, Pava, & Rosenbaum, 1994; Otto et al., 1997; Simons, Levine, Lustman, & Murphy, 1984), particularly among individuals who achieve full remission (Peselow, Robins, Block, Barouche, & Fieve, 1990). Moreover, in developmental studies, negative cognitions and negative moods covary over time, making it difficult to estimate the causal relationships between these variables (Garber, Keiley, & Martin, 2002). Likewise, acute pharmacotherapy effects also have been reported; in healthy participants, administration of d-fenfluramine (a serotonin agonist) was associated with significant decreases in dysfunctional attitude scores over the course of an hour (Meyer et al., 2003).

Despite the apparent reactivity of dysfunctional attitudes to the current level of depressed mood, there is, nonetheless, evidence of trait-like features for DAS scores. In a study of adults being treated for major depression, Zuroff, Blatt, Sanislow, Bondi, and Pilkonis (1999) found strong mood-state-dependent effects for mean levels of dysfunctional attitudes, but also found a strong correlation between pre- and posttreatment DAS scores, indicating that across clinical states individuals tend to maintain their relative standing on levels of dysfunctional attitudes. Zuroff and associates (1999) have suggested that this reflects two components to dysfunctional attitudes: one that is mood state dependent and one that is trait-like and consistent over time.

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An alternative account likewise emphasizes the dependence of dysfunctional attitudes on mood state, but also suggests that depression may have enduring effects on dysfunctional attitudes. This “scarring” account (e.g., Lewinsohn, Steinmetz, Larson, & Franklin, 1981) suggests that as a consequence of depression, relatively permanent residual elevations in dysfunctional attitudes remain and make the individual more likely to experience future depressive episodes (see also Ingram et al., 1998). In perhaps the best demonstration of cognitive scarring effects, Nolen-Hoeksema, Girgis, and Seligman (1992) documented enduring changes in attributional styles (rather than dysfunctional attitudes) following depressive episodes in children. Hence, changes in thinking styles may be one consequence of depressive episodes and may play a role in the finding that past depression is a powerful predictor of future episodes (e.g., Gonzales, Lewinsohn, & Clarke, 1985; Kendler, Thornton, & Gardner, 2001). Consistent with this hypothesis, adults treated for depression sometimes show residual elevations of dysfunctional attitudes (Dobson & Shaw, 1986; Eaves & Rush, 1984; Farmer et al., 2001), and these elevations have been linked to risk for relapse (e.g., Rush, Weissenburger, & Eaves, 1986; Simons, Murphy, Levine, & Wetzel, 1986; Thase et al., 1992; for contradictory results, see Iardi, Craighhead, & Evans, 1997).

Although these results are promising for demonstrating the predictive validity of dysfunctional attitudes, the meaning of these findings is clouded by the association between dysfunctional attitudes and mood state, in which elevations in dysfunctional attitudes may be a function of residual symptoms of depression in individuals with recurrent depression (Lewinsohn, Allen, Seeley, & Gotlib, 1999). This is important because residual levels of depression tend to be excellent predictors of relapse on their own (e.g., G. A. Fava, Grandi, Zielezny, Rafanelli, & Canestrari, 1996; Kendler et al., 2001; Thase et al., 1992). Accordingly, associations between dysfunctional attitudes and relapse may have little to do with a unique role for dysfunctional attitudes, but may simply reflect the way in which any of a number of residual symptoms may predict relapse. Further, prediction of relapse (in the absence of predicting the initial depressive episode) does not disentangle traditional vulnerability versus scarring accounts.

In summary, despite the wealth of evidence showing an association between dysfunctional attitudes and depression, additional information is needed regarding the temporal nature and meaning of this association, particularly in relation to the impact of past and current mood. To address these issues, we utilized data from the Harvard Study of Moods and Cycles, one of the largest population-based studies of late reproductive-aged women, who received in-person, structured clinical interviews to identify the presence of psychiatric disorders (Harlow, Cohen, Otto, Spiegelman, & Cramer, 1999; 2002), and who were assessed prospectively to examine the emergence of depressive episodes and changes in hormonal functioning. At baseline, the Moods and Cycles study selected women with a history of past or present major depression and provided a large comparison group of women without this history. This selection strategy provides an ideal context for examining the association between dysfunctional attitudes and the onset and recurrence of depression in a community sample, and meets design criteria recommended by Haefel and associates (2005) for studies of cognitive risk factors in samples of individuals in recovery from depression. Furthermore, the longitudinal aspects of the study provide a perspective on both the predictive value of DAS scores and how these scores change across episodes of depression and recovery, allowing us to evaluate whether dysfunctional attitudes are a risk factor, a consequence, or simply a mood-state correlate of depressed mood.

Specifically, we examined the evidence for a link between a past history of depression and baseline dysfunctional attitudes, taking into account the influence of current mood state. Consistent with hypotheses that DAS scores both are reactive to depressed mood and maintain trait-like features (Zuroff et al., 1999), we hypothesized that DAS scores would be significantly associated with current mood state (as assessed by symptoms of depression) but would nonetheless retain predictive significance beyond that afforded by consideration of mood state. In particular, we predicted that individuals with past depression would have lower DAS scores than those with current depression, but would have higher scores than individuals who had never been depressed.

In the prospective phase of our study, we examined the predictive significance of dysfunctional attitudes relative to the prediction afforded by consideration of mood state and depression history. We hypothesized that, as with previous studies, DAS scores would predict prospective episodes of depression, but that this prediction would be attenuated or eliminated by consideration of mood state and history of depression. Also, because dysfunctional attitudes sometimes interact with life stressors to predict depression (cf. Brown, Hammen, Craske, & Wickens, 1995; Olinger, Kuiper, & Shaw, 1987; Robins & Block, 1989; Scher, Ingram, & Segal, 2005; Wise & Barnes, 1986), we examined whether maladaptive thinking would have more robust predictive effects when considered in interaction with negative life events. Finally, we examined whether adults who recovered from a prospectively observed episode of depression had evidence of scarring (i.e., an incremental increase in dysfunctional attitudes following depression that predicts future depressive episodes). We examined evidence for scarring in individuals with and without a prior history of depression, and hypothesized that evidence of scarring (increases in DAS scores among individuals with, relative to those without, an intervening depressive episode) would be found in both groups. Altogether, these analyses provide a comprehensive perspective on the way dysfunctional attitudes are linked to depressive episodes in a large, epidemiologically derived cohort of women.

Method

Participants and Procedures

The cohorts for The Harvard Study of Moods and Cycles were derived from a population-based cross-sectional sample of 5,814 women between the ages of 36 and 44, selected from seven Boston metropolitan area communities using Massachusetts Town Books (annual publications that list residents by name, age, and address according to voter precincts). After two mailings and a follow-up telephone call, 4,164 women (72%) completed screening questionnaires; from these women, we selected our target cohorts. To fulfill the aims of the parent study, a total of 643 never-depressed women and 333 women with a history of past or present depression were selected for the study, and only these individuals completed in-person diagnostic evaluations (for methodological details see Harlow et al., 2002). These cohorts were followed longitudinally, with
assessments occurring every 6 months for up to 3 years. Retention rates were 98% at the 6th month, 95% at the 12th month, 93% at the 18th month, 91% at the 24th month, and 89% at the subsequent assessments.

For the current study, women with dysthymia alone at baseline (n = 15) were excluded from further analysis because this diagnostic group has not been well studied in previous investigations of dysfunctional attitudes, and because this group may obscure differences in dysfunctional attitudes between those with and those without a history of major depressive disorder, our primary groups of interest. An additional 139 women did not complete the DAS at baseline and 72 did not complete the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960). Thus, 750 women were eligible for the present study: 500 with no history of depression, 230 with past depression, and 20 with depression at baseline.

The average age of these 750 women was 40.9 years (SD = 2.5). Approximately 41% of the sample had partial or full graduate school education, 35% were college graduates, 19% had some college or vocational technical education, and 5% were high school graduates. At baseline, the majority of women were married (75%), 10% were formerly married, and 15% were never married. Seventy-nine percent of the sample was working outside the home, 13% identified as homemakers, and less than 1% was disabled. The remainder reported student or part-time work status. Comorbidity was common in the sample, with greater representation among individuals with past or current depression; 25.5% of the sample met Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM–IV; American Psychiatric Association, 1994) criteria for a lifetime (past or current) diagnosis of an anxiety disorder other than specific phobia, 8% had a lifetime substance use disorder other than nicotine dependence, 4.5% met criteria for an eating disorder, and less than 1% met criteria for hypochondriasis or body dysmorphic disorder.

Diagnostic status was determined by in-person interviews (Structured Clinical Interview for DSM–IV Axis I Disorders [SCID]; First, Spitzer, Gibbon, & Williams, 1997) at baseline and by phone interviews thereafter. In addition to documenting the presence of major depressive disorder and absence of bipolar disorder, structured diagnostic evaluation at baseline included assessing the presence of anxiety and substance use disorders as well as eating disorders (anorexia, bulimia nervosa, binge eating disorder), hypochondriasis, and body dysmorphic disorder. Moreover, in the baseline clinical interview, the total duration of episodes across the lifespan and the number of episodes of major depression were recorded (coded for analysis as 1, 2, or 3 or greater due to strong positive skew), as well as age of onset of the index episode of major depression. Only episodes of major depression defined by DSM–IV criteria for a major depressive disorder (e.g., not due to the effects of a substance and not part of a bipolar disorder) were defined as index or prospective depressive episodes. For multiple episodes of depression to be counted retrospectively, participants had to describe a return to symptom-free status for a minimum of 2 weeks; if remission did not occur during the span of time between two apparent episodes, the entire epoch of time was recorded as a single episode of depression. Diagnostic assessments at each of the 6-month evaluation points during the prospective phase of the study provided information for determining the emergence of a DSM–IV major depressive episode during that time epoch (e.g., “since the last time we talked [date specified along with seasonal or media events marking that time period] have you had a period of time when you were depressed or down most of the day?”); month of onset was recorded according to patient report once disorder criteria were documented. Interviews were completed by trained diagnostic raters (e.g., trained in threshold responses for each SCID item and interviewing techniques), and were subsequently reviewed by Michael W. Otto and Lee S. Cohen, who were blind to other subject characteristics (e.g., DAS or HRSD scores).

Measures

DAS. Dysfunctional attitudes characteristic of depression were assessed with the DAS form A (A. N. Weissman, 1979; A. N. Weissman & Beck, 1978). The DAS is a self-rated questionnaire that measures rigid, negative, and perfectionistic attitudes associated with depression. In particular, it targets beliefs about specific contingencies between behavior and self-worth. It consists of 40 items that are rated on a Likert scale from 1 to 7, indicating the degree of belief in the dysfunctional attitude. Test–retest reliability for this measure has been found to be .84 (Dobson & Breiter, 1983).

Life Experience Survey (LES). The LES (Sarason, Johnson, & Siegel, 1978) is a 57-item scale used to assess the occurrence and impact of various life events. Participants report whether they have experienced any of a list of 57 events in the past 6 months and rate the impact of these events at the time of occurrence according to a 7-point scale (3 = extremely positive impact, 0 = no impact, −3 = extremely negative impact). Only the actual number of negative life events was included as a predictor in this study (to ensure that presence of negative life events was not confused with the degree of impact ratings). Similarly, to avoid confusion of symptoms of depression with independent stressors, we excluded LES items that assess neurovegetative symptoms of depression (i.e., sleep- and eating-habit disruption; consistent with Otto et al., 1997). The LES was administered every 6 months during the study period via packets sent by mail. The variable used for participants who did not experience a prospective depressive episode was the average LES score across the study period; for patients with a prospective depression, we used scores recorded up to the time epoch when the depression occurred.

Depression severity (reflecting baseline mood state) at the time of entry into the study was assessed in person by the diagnostic raters using the 17-item HRSD (Hamilton, 1960).

Results

DAS Scores and Depression Status

Table 1 presents the means and standard deviations of relevant measures for DAS and HRSD scores among the never-depressed, past-depression, and current-depression groups. As hypothesized, analysis of variance (ANOVA) indicated that DAS total scores at study baseline differed significantly between groups as defined by depression status, F(2, 747) = 84.3, p = .0001, with the highest scores in the current-depression group, followed by the past-depression group, and then the never-depressed group. Tukey’s follow-up tests indicated significant differences between each of the three groups, with a near-large effect (d = .77) for the differ-
ence in DAS scores between the never-depressed and the past-depression cohorts, and a very large effect ($d = 1.45$) for the additional difference between the past-depression and the current-depression cohorts, according to Cohen’s (1988) standards.

Because depressed mood state is a reliable correlate of DAS total scores, we examined the significance of differences between the never-depressed and past-depression cohorts while controlling for level of subclinical or residual depressive symptoms as assessed by the HRSD. When levels of these symptoms were statistically controlled in an ANCOVA, differences between these groups continued to be significant, $F(1, 727) = 47.7, p = .0001, d = .55$. Consistent with expectations of a link between DAS scores and mood symptoms, the association between the HRSD (the covariate) and DAS scores was also significant and positive, $F(1, 727) = 24.9, p = .0001$. Homogeneity of regression assumptions were met; that is, there was not a differential association between DAS and HRSD scores across the never-depressed and past-depression groups (in contrast to Lewinsohn et al., 1999). These findings suggest that dysfunctional attitudes were not simply an epiphenomenon of symptom severity as measured by the HRSD; group differences remained even when we controlled for subclinical depressed mood.

### Characteristics of Past Depression and DAS Scores

Individuals with past depression had a raw mean of 2.8 ($SD = 2.8$) episodes; 38% of the sample had 1 past episode, 23% had 2 past episodes, and 39% had 3 or more past episodes. Mean age of onset was 25.9 ($SD = 9.5$) years. Within the sample of 230 participants with a past history of depression, total DAS scores at baseline were significantly associated with the number of previous episodes of depression in linear regression analyses, $F(1, 223) = 7.0, p = .001$, increment to $R^2 = .03$, even when we controlled for levels of residual depression (using HRSD scores). DAS scores were not linked to the total lifetime duration of depression and dysthymia, $F(1, 232) = 2.2, p > .10$, increment to $R^2 = .01$, nor to the age of onset of depression, $F(1, 225) = 0.8, p > .10$, increment to $R^2 = .003$.

### Prediction of New Episodes: Evaluation of the Predictive Significance of DAS Scores

We used survival analysis to assess the influence of DAS scores on time to new or recurrent onset of major depression. The risk period was defined as the number of months from the baseline interview to (a) the follow-up interval in which a woman reported a new or recurrent onset of major depression, or (b) the end of the study observational period. Cox proportional hazards regression models were used to estimate the hazard ratio (the relative risk of an event taking into account changes in risk over time) and 95% confidence intervals for the relation between DAS scores and new or recurrent onset of depression over 36 months of follow-up, while adjusting for baseline depression severity. We used the “exact” option of the SAS (Version 8.0; SAS Institute, Cary, NC) proportional hazards regression procedure to handle the high proportion of ties due to imprecise measurement of event times (with evaluations every 6 months).

Over the 3-year longitudinal study, new episodes of depression were observed in 26 (5.2%) of the 500 women without a history of depression and 86 (37.4%) of the 230 women with a history of depression. Table 2 provides the hazard ratios from the proportional hazards regression analysis of predictors of new episodes of depression for the never-depressed and past-depression cohorts. Hazard ratios significantly greater than 1 signify an increase in risk of future depression, whereas those significantly less than 1 signify a decrease in risk. As summarized in Table 2, DAS scores were predictive of new episodes of depression, and this relationship continued to be significant when we controlled for the levels of depressed mood at baseline as assessed by the HRSD. Under these conditions, every 10 points of DAS elevation was associated with a 13% increase in the risk of future depression. However, this association was not robust to the shared prediction between DAS scores and history of depression. When history of depression was statistically controlled, DAS scores no longer predicted depression onset.

Moreover, when the never-depressed or past-depression cohorts were considered separately, there was no significant prediction of DAS scores for either group (with identical and nonsignificant hazard ratios of 1.04), indicating that the predictive significance of the DAS for the combined cohorts was substantially confounded with depression history.

### Further Evaluation of DAS Scores: Potential Interaction With Negative Life Events

We examined whether DAS scores might have more robust predictive effects when considered in interaction with negative life events. Evaluation of this interactive effect requires that the com-

<table>
<thead>
<tr>
<th>Measure</th>
<th>Never depressed ($n = 500$)</th>
<th>Formerly depressed ($n = 230$)</th>
<th>Currently depressed ($n = 20$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total DAS Score</td>
<td>M 96.9</td>
<td>SD 24.2</td>
<td>M 117.8</td>
</tr>
<tr>
<td>HRSD</td>
<td>2.4</td>
<td>2.5</td>
<td>5.7</td>
</tr>
<tr>
<td>Baseline NLE score</td>
<td>1.3</td>
<td>1.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Mean NLE scores</td>
<td>1.2</td>
<td>1.2</td>
<td>2.1</td>
</tr>
</tbody>
</table>

*Note.* Mean scores are computed as the average score across observation periods preceding the onset of prospective depressive episodes if they occurred. DAS = Dysfunctional Attitude Scale; HRSD = Hamilton Rating Scale for Depression; NLE = Negative Life Events.

Table 1

*Mean DAS Total and Subscale Scores and HRSD Severity Scores by Group*
ponent main effects of predictors be entered in the model; consistent with the literature, the main effect of negative life events predicted prospective depressive episodes (see Table 2). This prediction remained significant even when baseline HRSD scores, depression history, and DAS scores were entered in the model. In contrast, there was no evidence of enhanced risk as measured by the interaction of negative life events and DAS scores. Indeed, the interaction term indicated an attenuation of the risk afforded by consideration of the additive effects of negative life events and DAS scores (see Table 2). Moreover, paralleling the earlier analyses for the DAS, the interaction of DAS scores and negative life events was no longer a significant predictor accounting for the predictive influences of depression history and HRSD scores at baseline (see Table 2). In sum, consideration of the role of the interaction of DAS scores and negative life events provided no support for a general diathesis–stress model of the role of DAS scores in depression.

Changes in DAS Scores Over Time: Evaluation of Progressive Scarring Effects

Of the participants in this study, 315 women were euthymic at baseline and completed the DAS at baseline and at the 36-month follow-up evaluation (this sample had rates of prospectively identified depression nearly identical to those of the remainder of the cohort who did not complete the DAS at the 36-month evaluation). Among this subgroup, 36 (11.4%) developed and then recovered from a depressive episode during the 36-month follow-up period. Evaluation of the changes in the DAS scores for these 36 women relative to the remainder of the sample (who did not experience prospectively identified depression) provides an index of potential scarring effects of the depressive episode on attitudes.

To address the question of whether there is scarring among women who experienced a prospective episode of depression occurring for the first time (initial scarring) or in interaction with a past history of depression (progressive scarring), we examined change in DAS scores using a 2 × 2 ANOVA with two between-subjects factors: a history of depression (present vs. absent) and an intervening episode of depression (present vs. absent). The full factorial design allowed us to examine the effects of a prospective episode of depression relative to the natural course of DAS changes in women who did not get depressed. There were no significant main or interaction effects (see Table 3; all effects at $p > .10$), and there was an overall trend toward decreasing DAS scores across follow-up that was not significant according to a single-sample $t$ test, $t(35) = 1.64, p = .10, d = .09$. These results provide no evidence for chronic deleterious effects of depressive episodes on DAS scores in adult women, following either the first or subsequent depressive episodes. Also, DAS scores between the baseline evaluation and 3-year follow up proved to be relatively stable, with a correlation in DAS scores across this time interval of $r = .74$.

Discussion

In a large, community-based cohort of women, we found that a past history of depression was associated with elevations in dysfunctional attitudes as assessed by the DAS, even when we controlled for subclinical levels of depressive symptoms. DAS levels

Table 2

<table>
<thead>
<tr>
<th>Baseline variable</th>
<th>Crude (HR 95% CI)</th>
<th>Adjusted for HRSD score (HR 95% CI)</th>
<th>Adjusted for HRSD &amp; history (HR 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRSD score (&lt;8 to &gt;8)</td>
<td>4.00 (2.56 to 6.11)</td>
<td>8.04 (5.10 to 12.7)</td>
<td>1.04 (0.98 to 1.10)</td>
</tr>
<tr>
<td>Depression history (no to yes)</td>
<td>8.95 (5.77 to 13.9)</td>
<td>8.04 (5.10 to 12.7)</td>
<td>1.04 (0.98 to 1.10)</td>
</tr>
<tr>
<td>DAS total score (10-pt change)</td>
<td>1.17 (1.11 to 1.24)</td>
<td>1.13 (1.07 to 1.20)</td>
<td>1.04 (0.98 to 1.10)</td>
</tr>
</tbody>
</table>

Table 3

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean change</th>
<th>95% CI</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No history of depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No prospective depression</td>
<td>224</td>
<td>−0.8</td>
<td>−3.1 to 1.5</td>
<td>17.4</td>
</tr>
<tr>
<td>New episode of depression</td>
<td>11</td>
<td>−8.1</td>
<td>−18.1 to 2.0</td>
<td>15.0</td>
</tr>
<tr>
<td>History of depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No prospective depression</td>
<td>55</td>
<td>−1.3</td>
<td>−8.4 to 5.8</td>
<td>26.3</td>
</tr>
<tr>
<td>New episode of depression</td>
<td>25</td>
<td>1.7</td>
<td>−6.8 to 10.3</td>
<td>20.8</td>
</tr>
</tbody>
</table>
for the formerly depressed cohort were intermediate between those for the currently depressed and never-depressed cohorts. Furthermore, within the formerly depressed cohort, DAS scores were linked to the number of previous episodes of depression, although this effect was small to moderate in size ($r = .17$; for a related finding, see Norman et al., 1988). This finding is consistent with both vulnerability and scarring accounts of the association between depression and recurrent depression. From the vulnerability perspective, the recurrent episodes of depression are a consequence of traitlike elevations in dysfunctional attitudes. From a scarring perspective, the elevated DAS scores are an enduring consequence of depression, with greater sustained elevations among those with more episodes.

To better understand the association between history of depression and DAS scores, we investigated both scarring and trait-vulnerability accounts in the prospective phase of our study. First, we assessed dysfunctional attitudes across a prospectively observed episode of depression and recovery to evaluate evidence for initial scarring in the never-depressed cohort, as well as “progressive” scarring in the cohort with past depression. Second, we investigated the degree to which elevations in dysfunctional attitudes placed individuals at risk for future depression, with particular attention to the prediction of episodes among individuals with no history of depression.

Concerning the impact of depression and recovery on DAS scores, we found no evidence for depressive scarring. Over a 3-year interval, there were no differential changes in DAS scores among individuals who did and did not have a new or recurrent depressive episode. Instead, we found that individuals tended to maintain their relative standing ($r = .74$) in scores regardless of an intervening depressive episode. This finding is consistent with a state–trait model of dysfunctional attitudes (Zuroff et al., 1999), in which DAS mean scores may change with level of depressed mood but also reflect an enduring trait or individual difference. We believe that a similar state–trait model best fits our observations of DAS scores. Specifically, we found evidence that DAS scores were linked to subsyndromal or residual levels of depression but that, nonetheless, chronic elevations were evident in individuals with past depression. These elevations were also predictive of future episodes of depression. We found that DAS scores independently predicted prospective episodes of depression over the 3-year study period when baseline HRSD scores were statistically controlled.

However, one limitation of this model was that predictive significance for future episodes of depression was confounded with depression history. That is, when the predictive influence of depression history was statistically controlled, DAS scores did not predict prospective episodes of depression. It is unlikely that this lack of prediction was simply due to a limited range of DAS scores, given that scores ranged from 40 to 175 in the never-depressed cohort and 51 to 224 in the formerly depressed cohort. Moreover, when each cohort was examined separately, variability in DAS scores offered no significant prediction of prospective episodes of depression.

Similar failures for dysfunctional attitudes to serve as a unique vulnerability factor have been documented when depression history and residual symptoms were eliminated as confounding predictors. For example, within a sample of young adults selected on the basis of depression history, Hart, Craighead, and Craighead (2001) found that DAS scores offered no significant prediction of the risk of depression recurrence. Likewise, in a longitudinal study of patients who had recovered from depression, Ilardi et al. (1997) found the DAS did not significantly predict subsequent episodes. Hence, our study confirms this lack of prediction among individuals with a past history of depression, but, more seriously, we failed to document significant prediction of new episodes of depression in a large sample of women without a history of depression. Furthermore, this lack of prediction was not a function of a differential relationship between depressive symptoms and dysfunctional attitudes in never-depressed versus formerly depressed individuals (see Lewinsohn et al., 1999), as there was no evidence of differential associations (slopes) between depressive symptoms and DAS scores in these two groups (i.e., homogeneity of regression was supported). Note that this lack of differential association also runs counter to Teasdale’s differential activation hypothesis (Teasdale, 1983, 1988), which proposes that dysphoric mood will more readily activate negative thinking among persons with a history of depression (see also Segal, Williams, Teasdale, & G enormous, 1996).

The degree to which the predictive significance of DAS scores is bound up with depression history is of concern for a vulnerability account. This pattern of findings presents an explanatory conundrum for which we have no easy solution. Our prospective analyses provided no support for scarring hypotheses, and hence we are opposed to viewing elevated DAS scores as a simple consequence of a past depressive episode. However, if DAS elevations represent a traitlike vulnerability, it is unclear why they were not predictive of future depression when the never-depressed and formerly depression cohorts were examined separately.

One possibility is that the apparent prediction afforded by DAS scores is mediated by a third variable that is much more tightly linked to past depression, and is not well distributed among the never-depressed cohort. One potential candidate for this mediating role is Axis II pathology, which has been linked to both dysfunctional attitudes and depression (Ilardi & Craighead, 1999) and appears to be a better predictor of depression recurrence than DAS scores (Hart et al., 2001; Ilardi et al., 1997). Accordingly, Axis II pathology may be a stronger predictor of depression and may account for the link between a history of depression and sustained elevations in DAS scores, leaving DAS scores as an inconsistent proxy predictor of depression onset. However, this hypothesis is speculative and awaits further empirical evaluation.

There has also been attention in the literature to the role of mood induction in “activating” levels of dysfunctional attitudes to provide a potentially more meaningful measure of these attitudes (e.g., Ingram, Miranda, & Segal, 1998; Persons & Miranda, 1992; Scher, Ingram, & Segal, 2005). Our study did not utilize these methods, in part because we were investigating the limits of traditional, traitlike vulnerability accounts of dysfunctional attitudes. Thus, we cannot comment on whether mood-induction primes would have yielded a more effective predictor of future depression onset. However, it is important to note that such priming may simply reflect the mood-state dependency of the DAS, rather than revealing differential vulnerability to future depression (e.g., Brosse, Craighead, & Craighead, 1999; Solomon, Haaga, Brody, Kirk, & Friedman, 1998). In addition, stress is also considered an effective prime for dysfunctional attitudes (see Scher et al., 2005), and our study provided no support for an enhanced risk of depression.

Concerning the impact of depression and recovery on DAS scores, we found no evidence for depressive scarring. Over a 3-year interval, there were no differential changes in DAS scores among individuals who did and did not have a new or recurrent depressive episode. Instead, we found that individuals tended to maintain their relative standing ($r = .74$) in scores regardless of an intervening depressive episode. This finding is consistent with a state–trait model of dysfunctional attitudes (Zuroff et al., 1999), in which DAS mean scores may change with level of depressed mood but also reflect an enduring trait or individual difference. We believe that a similar state–trait model best fits our observations of DAS scores. Specifically, we found evidence that DAS scores were linked to subsyndromal or residual levels of depression but that, nonetheless, chronic elevations were evident in individuals with past depression. These elevations were also predictive of future episodes of depression. We found that DAS scores independently predicted prospective episodes of depression over the 3-year study period when baseline HRSD scores were statistically controlled.

However, one limitation of this model was that predictive significance for future episodes of depression was confounded with depression history. That is, when the predictive influence of depression history was statistically controlled, DAS scores did not predict prospective episodes of depression. It is unlikely that this lack of prediction was simply due to a limited range of DAS scores, given that scores ranged from 40 to 175 in the never-depressed cohort and 51 to 224 in the formerly depressed cohort. Moreover, when each cohort was examined separately, variability in DAS scores offered no significant prediction of prospective episodes of depression.

Similar failures for dysfunctional attitudes to serve as a unique vulnerability factor have been documented when depression history and residual symptoms were eliminated as confounding predictors. For example, within a sample of young adults selected on the basis of depression history, Hart, Craighead, and Craighead (2001) found that DAS scores offered no significant prediction of the risk of depression recurrence. Likewise, in a longitudinal study of patients who had recovered from depression, Ilardi et al. (1997) found the DAS did not significantly predict subsequent episodes. Hence, our study confirms this lack of prediction among individuals with a past history of depression, but, more seriously, we failed to document significant prediction of new episodes of depression in a large sample of women without a history of depression. Furthermore, this lack of prediction was not a function of a differential relationship between depressive symptoms and dysfunctional attitudes in never-depressed versus formerly depressed individuals (see Lewinsohn et al., 1999), as there was no evidence of differential associations (slopes) between depressive symptoms and DAS scores in these two groups (i.e., homogeneity of regression was supported). Note that this lack of differential association also runs counter to Teasdale’s differential activation hypothesis (Teasdale, 1983, 1988), which proposes that dysphoric mood will more readily activate negative thinking among persons with a history of depression (see also Segal, Williams, Teasdale, & G enormous, 1996).

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among individuals with higher DAS scores who were exposed to life stressors (as evaluated by the interaction between DAS scores and negative life events).

**Limitations**

Our study was part of a larger investigation of the link between depression and the perimenopause. Accordingly, our results may be specific to women and/or the age range of the cohorts studied (ages 36–46 during the course of the longitudinal monitoring). Depressed women have been found to score higher on the DAS than depressed men (e.g., on the DAS Dependency subscale; Farmer et al., 2001), although the role of DAS scores in relation to depression has otherwise been assumed to be consistent across the sexes. However, additional research is needed to examine whether the results from our present study can be extended to men.

Concerning age range, we may have obtained a lower incidence of initial depression onset for the never-depressed women given that our sample was well past the mean age of onset and faced a different rate of onset than younger cohorts (Kessler et al., 2003; M. M. Weissman et al., 1996). Furthermore, it is notable that evidence for the scarring effects of depressive episodes on cognitions comes from longitudinal studies of grade school-age children rather than from adolescents or adults (e.g., Nolen-Hoeksema et al., 1992; see also Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998). Moreover, these studies have used measures other than dysfunctional attitudes (e.g., attributional style), and there is at least some evidence suggesting that measures of attributional style may be more sensitive to potential scarring effects than are dysfunctional attitudes (Haeffel et al., 2005). We hypothesize that the influence of depressed mood on attitudes may be attenuated across development, so that early experiences of depression have more enduring effects on attitudes than later episodes. It is noteworthy that in our study there was an absence of an association between DAS scores and age of onset of depression, but the ages of onset in our study (M = 25.6 years; SD = 9.5) tended to be outside the range of those in Nolen-Hoeksema et al.’s (1992) study of children.

One of the strengths of our study was the assessment of a large community sample that may provide a broader perspective on depressed women than samples drawn from clinical practice (see Haeffel et al., 2005). Nonetheless, our study did not consider the role of hormonal changes as this study cohort entered perimenopause (Harlow, Wise, Otto, Soares, & Cohen, 2003), nor the presence, intensity, or modality of treatment that may have led to clinical improvement in this sample. Although improvements in dysfunctional attitudes appear to be a ubiquitous effect of successful depression treatment (e.g., M. Fava et al., 1994), recent accounts of the efficacy of cognitive therapy have emphasized not just changes in the level of dysfunctional thoughts but also shifts in the relationship between dysfunctional cognitions and depressive symptoms (e.g., Beevers & Miller, 2005; Lewinsohn et al., 1999; Teasdale et al., 2002). Studies on metacognition, for example, suggest that cognitive interventions may be useful for helping patients gain distance from their negative thoughts and feelings so that these events are not seen as “necessarily valid reflections of reality” (Teasdale et al., 2002, p. 285). Moreover, Teasdale and associates (2002) have shown that such changes in metacognitive awareness may mediate the relapse prevention effects of cognitive therapy. Our study was limited to the investigation of thought content as assessed by dysfunctional attitudes; more in-depth study of the relationship between dysfunctional attitudes and symptoms over time might identify relationships between thoughts and symptoms that are distinct from the issues studied here.

It is also important to acknowledge that self-report strategies for assessing life events are not without their limitations (e.g., McQuaid, Monroe, Roberts, Kupfer, & Frank, 2000), and there are a range of issues to be considered in the assessment of dysfunctional attitudes. We selected the DAS, a widely used index of dysfunctional attitudes. Even so, as discussed by Alloy and colleagues (Alloy, Abramson, Murray, Whitehouse, & Hogan, 1997), self-report questionnaires may be overly influenced by motivation and expectations, and typically assess conscious, controlled processes. Therefore, many researchers expect that cognitive vulnerability will be more readily observed on measures of automatic cognitive processes (Hartlage, Alloy, Vazquez, & Dykman, 1993) that are less controllable. In addition, Segal (1988) has questioned the validity of using endorsement questionnaires of thought content because these measures may reflect variations in negative verbalizations rather than underlying cognitive structure (the vulnerability factor implicated by cognitive schema theory). Nonetheless, we view dysfunctional attitudes as an important product of depressogenic schema, and their predictive role was evident in this study, albeit redundant with other predictors. Also, the choice to evaluate dysfunctional attitudes as a predictor of depression after accounting for the variance explained by depression history was considered important to rigorously evaluate the unique predictive validity of dysfunctional attitudes. Although we recognize that this approach tends to ignore the potential contribution of negative thinking to the prior experience of depression, it is consistent with the lack of prediction for the DAS in the group with no history of depression.

**Conclusion**

Research indicates that there are prominent, mood-state effects on dysfunctional attitudes. The current findings are consistent with these effects, including an association between DAS scores and subsyndromal levels of depressive symptoms. Over and above these mood-specific effects, dysfunctional attitudes were predictive of prospective episodes of depression in women, but only when history of depression was ignored. Our prospective data also suggested there were no chronic negative effects of depressive episodes on DAS scores in adult women, following either initial or recurrent episodes of depression.

**References**


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