Clinical Risk Factors for the Generation of Life Events in Major Depression

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This study examines the relationship of anxiety disorder and dysthymia comorbidity to the generation of life events prior to major depression episode onset in a cross-sectional community sample of 76 women. Those with comorbid anxiety and dysthymia experienced higher rates of events that were at least partly dependent on their own behavior but did not differ from those without these clinical risk factors on independent life events outside of their control. This relationship remained significant even after controlling for overall severity of depression and demographic covariates. The implications of these results for understanding the increased rates of major depression onset and recurrence among those with comorbid anxiety and dysthymia are discussed as avenues of future research.

A large number of cross-sectional and prospective studies conducted over the last 30 years have provided strong evidence for the role of stressful life events in precipitating the onset of major depressive episodes (see Mazure, 1998). The most compelling evidence has come from community prospective studies conducted by George Brown and colleagues using sophisticated contextual interview approaches to the assessment of life events. These researchers have repeatedly demonstrated that individuals who experience a severely stressful life event, such as divorce or job loss, are up to 3 times more likely than those without such an event to develop a major depressive episode in the subsequent 3–6 months (e.g., Brown, Bifulco, & Harris, 1987; Brown & Harris, 1989).

Only recently, however, have investigators begun to examine the reverse causal relationship, that is, the role of depression, and its resulting dysfunction, in generating stressful life events. Hammen’s (1991) stress generation hypothesis represents a compelling framework within which to understand the bidirectional nature of this relationship. Hammen (1991) proposed that those with a history of recurrent depressive episodes generate stressful life events because of a mixture of maladaptive personality characteristics and disrupted social support networks resulting from these previous episodes. Therefore, individuals with a history of depression will be more likely to experience events that are at least in part dependent on their own behavior or characteristics (e.g., a relationship breakup, being fired from a job, being arrested) because their psychological circumstances have, in fact, contributed to the likelihood of experiencing these events. By contrast, a history of depression should not increase the likelihood of experiencing independent events outside of the individual’s control (e.g., a mother-in-law’s death, a confidant moves away to start school, a tornado; see Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978). Empirical support for the role of recurrent depression in generating dependent versus independent stressful life events has been found in a number of clinical samples (Hammen, 1991; Harkness, Monroe, Simons, & Thase, 1999) and community samples (Davila, Hammen, Burge, Paley, & Daley, 1995; Potthoff, Holahan, & Joiner, 1995). In addition, results of a very recent study suggest that dependent events are more likely to precipitate recurrences among those with a history of depressive episodes (Maciejewski, Prigerson, & Mazure, 2000).

Hammen and her colleagues have recently extended the above findings to an investigation of additional variables that increase the likelihood of stress generation, such as Axis I comorbidity (Daley et al., 1997). In a 2-year prospective study of adolescent women, these investigators found that those with major depression alone at Year 1 experienced significantly higher levels of dependent events at Year 2 than those with no disorder, supporting the general stress generation hypothesis. In addition, those with a comorbid Axis I diagnosis at Year 1 experienced significantly higher levels of dependent events at Year 2 than those with major depression alone. By contrast, no group differences were found on independent events. These results held even after controlling for Year 1 depression severity, suggesting that comorbidity in particular increases the generation of stressful life events, perhaps as a result of the further psychosocial dysfunction produced by the symptoms of these additional disorders.

The above results have intriguing implications for understanding the role of stress generation in the onset and course of major depression. Clinical risk factors, such as comorbid anxiety disor-
ders or dysthymia, have repeatedly been associated with elevated rates of major depression relapse and recurrence (Coryell et al., 1988; Faravelli, Ambonetti, Pallanti, & Pazzaglia, 1986; Keller, Lavori, Endicott, Coryell, & Klerman, 1983; Keller, Lavori, Lewis, & Klerman, 1983; Levitt, Joffe, & MacDonald, 1991; Sherbourne & Wells, 1997). In addition, these clinical risk factors are associated with an increased risk for a first onset of major depression (e.g., Horwath, Johnson, Klerman, & Weissman, 1992). Given that these comorbid conditions in particular are associated with such a poor prognosis, it is incumbent on researchers to develop and test hypotheses regarding the mechanisms that mediate or moderate these associations.

In particular, we suggest that stress generation may be one mechanism underlying the association between anxiety or dysthymia comorbidity and major depression onset and recurrence. In other words, perhaps comorbid anxiety or dysthymia disorder diagnoses that precede or persist between major depressive episodes lead to the generation of stressful life events that are then triggers of a first or recurrent episode of depression. For example, individuals with dysthymia exhibit symptoms such as fatigue and low self-esteem, which may lead to tension in interpersonal relationships, thereby increasing the possibility of a relationship breakup. Similarly, an individual with a preexisting anxiety disorder, such as panic disorder with agoraphobia, may present with frequent work absences, increasing the possibility of getting fired. These acute events may then precipitate the first onset or recurrence of major depression. Therefore, although the stress generation hypothesis was originally developed to explain recurrences of depression, we suggest that even first episodes may be mediated through the mechanism of stress generation given the presence of preexisting clinical risk factors, such as anxiety disorder or dysthymia comorbidity.

The primary goal of the present study is to examine the role of two clinical risk factors—comorbid anxiety disorders and dysthymia—in the generation of stressful life events in a cross-sectional community sample of women in a current episode of major depression. In this study we extend previous findings, and the application of the stress generation hypothesis in general, in a number of ways. First, the original issue addressed by the stress generation hypothesis was to test whether, even in periods of remission, individuals with a history of recurrent depression show increased rates of dependent life events. Evidence supporting this association was used as evidence to suggest that stress generation may be a mechanism for understanding depression recurrence. The present research broadens the application of the stress generation hypothesis by examining a slightly different, though equally compelling, question. Specifically, do individuals in periods of remission from their major depressive episodes experience increased rates of dependent life events given the presence of premorbid and persisting anxiety disorder or dysthymia diagnoses? As noted above, evidence supporting this association would have important implications for understanding the high rates of major depression onset and recurrence among those with such comorbid conditions.

Second, both the independent and additive effects of comorbid anxiety and dysthymia on dependent versus independent events are examined. Therefore, this study broadens the scope of clinical diagnostic risk factors associated with stress generation and provides more fine-grained information regarding how these particular risk factors work together to potentially lead to higher levels of dependent versus independent events. Those individuals with both comorbid anxiety and dysthymia are expected to exhibit significantly higher levels of dependent events than those with one or the other, or neither, risk factor. Similarly, those with either comorbid anxiety or dysthymia are expected to have significantly higher levels of dependent events than those with neither of these risk factors. By contrast, we do not expect these clinical risk factors to be associated with higher levels of independent events.

Third, we control for the effects of significant sociodemographic characteristics on stress generation. This control is important because variables such as unemployment, poor education, and divorce or separation have been associated with higher rates of stressful life events (Brown & Moran, 1997; Hughes, Blazer, & George, 1988; Kessler & Essex, 1982; Perris, 1984; Turner, Wheaton, & Lloyd, 1995) and have been implicated in the generation of dependent life events in particular (Miller et al., 1986). Furthermore, these demographic characteristics have been associated with more severe and pervasive levels of psychopathology (Brown & Moran, 1997; Roy, 1987). Therefore, it is possible that the relationship of anxiety and dysthymia comorbidity to stress generation may be accounted for by the higher levels of demographic risk factors displayed by individuals with substantial comorbidity. Therefore, we examine the association of age, marital status, education, and employment status to the clinical risk factors and to dependent and independent events. Any significant demographic factors are included as covariates in the primary analyses. It is expected that anxiety disorder and dysthymia comorbidity will be independently associated with stress generation, even after controlling for these demographic risk factors.

Method

Participants

Participants were 74 women recruited from a middled sized community in the northwestern United States by way of newspaper advertisements and media requests on local television news programs. Table 1 presents their descriptive characteristics. All women were 18 years of age or older and met the following inclusion criteria: (a) Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM–IV; American Psychiatric Association, 1994), criteria for a current episode of nonpsychotic, nonbipolar major depressive disorder; and (b) duration of index episode of no more than 2 years. The duration criterion was used to maximize recall of the stressful life events that occurred prior to episode onset (Brown & Harris, 1978). Exclusion criteria included the presence of schizophrenia, schizoaffective disorder, bipolar disorder, psychotic subtype of major depression, active substance abuse or dependence, or concurrent medical disorder that could cause depression. Acutely suicidal participants were also excluded. Comorbid anxiety disorders were not excluded, although major depression had to be the primary diagnosis. This was a highly recurrent sample, with a median number of previous episodes of 5. Eight individuals were experiencing their first onset of depression. Fifty-one percent of women (n = 39) were receiving some sort of outpatient treatment in the community at the time of the study: psychotherapy (n = 13), medication (n = 17), or combined treatment (n = 17).

A total of 245 women participated in an initial phone screening to determine eligibility for the study. This phone screening involved questions regarding the presence of comorbid exclusionary diagnoses (e.g., substance use, presence of schizophrenia or bipolar disorder, presence of exclusionary medical disorders). In addition, the “major depressive episode” module of the Structured Clinical Interview for DSM–IV Axis I Disorders (SCID; First, Spitzer, Gibbon, & Williams, 1995) was administered to determine
Table 1
Demographic and Clinical Characteristics of the Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
<th>M</th>
<th>SD</th>
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<td>4</td>
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<td></td>
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<td>BDI score</td>
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Note. Median previous episodes = 5 (range = 0–20). HRSD = Hamilton Rating Scale for Depression; BDI = Beck Depression Inventory.

whether potential participants met criteria for major depression. As described below, the SCID provides a structured format for diagnosing major depression and has been used frequently in research on depression. The phone screenings were conducted by two advanced graduate students in clinical psychology. Both had received extensive training in interviewing skills and use of the SCID (see below).

On the basis of the phone screening, 90 women met study criteria and were scheduled for an interview. Excluded participants did not meet criteria for major depression (n = 80), had an episode duration of longer than 2 years (n = 48), or had a comorbid exclusionary diagnosis (n = 27). Of the 90 women who presented for the interview, 13 no longer met criteria for major depression at the time of the interview, and one reported hypomanic episodes. In addition, the onset of the comorbid anxiety disorder(s) had to precede the onset of the index major depressive episode by at least 6 months in order not to be confounded with life events (i.e., events cause comorbid diagnoses vs. comorbid diagnoses generate events). Two cases were excluded for not meeting this criterion, dropping the final sample to 74. All participants were paid for their involvement in the study, were provided with a list of treatment referrals, and were invited to attend a 3-hour cognitive-behavioral psychoeducational workshop on depression (based on Greenberger & Padesky, 1995).

Measures

Diagnostic. To determine current diagnoses of major depression, dysthymia, and comorbid anxiety disorders, the SCID (First et al., 1995) was administered to all participants. The reliability and validity of the SCID has been well-documented in the diagnosis of Axis I disorders (e.g., Williams et al., 1992). In the present study, the SCID interviews were conducted by two advanced graduate students in clinical psychology who had been previously trained extensively on the SCID with consecutive referrals to the University Psychology Clinic. This training consisted of (a) sitting in on live SCID interviews performed by interviewers who had attained "gold-standard" rating status, and (b) performing SCID interviews with a gold-standard SCID rater sitting in. Gold-standard raters included clinical faculty members and other advanced graduate students who had previously achieved reliability status. Trainees had to match the gold-standard diagnoses on at least three consecutive SCID interviews they performed. Such methods are typically used to train raters to gold-standard status (see Grove, Andreasen, McDonald-Scott, Keller, & Shapiro, 1981). Training also included weekly assessment practicum meetings involving comprehensive study and discussion of DSM-IV criteria for Axis I and II diagnoses, in addition to general interviewing skills building. Throughout the present project, the SCID interviewers received ongoing supervision by faculty members in clinical psychology.

Thirty-six percent (n = 27) of participants suffered from at least one current comorbid anxiety disorder, as determined by the SCID. Specific diagnoses included the following: posttraumatic stress disorder (n = 17), panic disorder (n = 14), social phobia (n = 12), and specific phobia (n = 4). As mentioned previously, the onset of the comorbid anxiety disorder(s) had to precede the onset of the index major depressive episode by at least 6 months.

DSM-IV criteria for dysthymic disorder require the presence of at least three dysthymia symptoms with an onset of at least 2 years prior to the first onset of major depression. Thirteen women in the present sample met full DSM-IV criteria for dysthymia. However, an additional 8 women met symptomatic criteria, and their symptoms preceded their first major depression onset but not by a full 2 years. The temporal criterion was relaxed to allow inclusion of these additional 8 participants who, although not meeting the full temporal criterion for dysthymia, nevertheless possessed the risk factor of premorbid dysthymia that is of primary interest in the present study. By definition, the onset of dysthymia in all cases occurred well in advance of the onset of the index major depressive episode. Nevertheless, to investigate potential differences between those who met full DSM-IV criteria for dysthymia versus those defined using the less stringent temporal criterion, we considered these two groups separately in the primary analyses reported below.

Based on the SCID diagnoses, a “clinical risk variable” was created with four levels: (a) no comorbid anxiety or dysthymia (n = 39), (b) comorbid dysthymia (n = 8), (c) comorbid anxiety (n = 14), and (d) both comorbid dysthymia and comorbid anxiety (n = 13).

Depression severity. The 17-item Hamilton Rating Scale for Depression interview (HRSD; Hamilton, 1960) and the 21-item self-report Beck Depression Inventory (BDI; Beck & Steer, 1987) were administered to determine the presence and severity of depression symptoms. Both measures are widely used in the study of depression, with interrater reliabilities ranging from .78 to .96 for the HRSD (Rehm & O’Hara, 1985) and internal consistency estimates ranging from .73 to .95 for the BDI (Beck, Steer, & Garbin, 1988).

Stressful life events. The Life Events and Difficulties Schedule (LEDs; Brown & Harris, 1978) is a semistructured contextual interview and rating system that includes questions encompassing a number of domains, including health, housing, employment, and marital, among others. In the present study, women were interviewed regarding all events occurring from 6 months prior to the onset of their index major depressive episode to the day of the interview, and all sessions were audiotaped. Only events occurring prior to episode onset were included in the present analyses. Following the interview session, the life event information was presented by the interviewer or a research assistant to a panel of 2–4 master’s-level raters. Raters and interviewers had received extensive training in the Bedford College LEDS procedures for defining and rating life events (see Brown & Harris, 1978) by Scott Monroe, a leading expert on the LEDS system in North America. Monroe provided ongoing supervision of life event ratings for the duration of this project.

Raters were unaware of the date of onset of the current depressive episode, the presence of comorbid anxiety and dysthymia, and the partic-
patients’ subjective response to the events, thus minimizing bias in the rating of life events information. All discrepancies among raters were resolved through group discussion and consensus, and the LEDS manual, containing over 5,000 case vignettes, was available to provide anchoring examples and standardization. In the LEDS system, the most important event rating is of long-term threat or severity, and previous research has established the reliability of LEDS ratings on this measure (Bifulco et al., 1989a, 1989b). Reliability studies in the laboratory in which this study was conducted have established pairwise comparisons of four raters on long-term threat ranging from .76 to .81 (M = .78; corrected for chance with Cohen’s kappa).

Consistent with the conventions of the LEDS (see Brown & Harris, 1978), all events were rated for their level of contextual threat on a 5-point scale. The threat ratings for each event were then added to create a cumulative threat score in which higher scores indicated greater levels of threat. All events were also coded for independence. Therefore, each participant had a separate cumulative threat score for dependent events and independent events. Independent life events were those totally or nearly totally independent of the behavior or characteristics of the individual (e.g., death of mother from cancer, tornado ruins house). Dependent life events were those coded as at least partly dependent on the behavior or characteristics of the individual. These included, for example, intentional acts by the participant (e.g., quit job), probable negligence on the part of the participant (e.g., fired from job because of poor performance), and interpersonal conflicts or crises (e.g., participant files for divorce). Similar to the threat ratings, distinctions between independent and dependent events were made on the basis of the context surrounding each event. For example, being fired from a job as a result of consistent tardiness indicates probable negligence on the part of the participant and, hence, would receive a dependent rating. By contrast, being fired from a job as a result of plant closure is clearly outside the individual’s control and, hence, this event would be rated as independent. The LEDS manual was available to help raters with the threat and independence ratings, and all discrepancies were resolved through consensus.

It is important to note that the concept of independence examined in the present study is contrasted with another related concept in the LEDS system: dependent-variable-related events (or illness-dependent events; Brown & Harris, 1978). This latter concept reflects the extent to which events resulted directly from the current episode of depression (e.g., a hospitalization or suicide attempt). By contrast, the concept of independence addressed by the stress generation hypothesis refers to the extent to which events result from the more general agency of the individual (e.g., quit job) versus being independent of the individual’s agency (e.g., death of mother from cancer). Consistent with most other studies using the LEDS, illness-dependent events (i.e., events clearly related to the current episode of depression) were excluded from the present analyses.

Results

Descriptive Characteristics of the Sample

Covariates associated with clinical risk groups. Preliminary chi-square analyses and one-way analyses of variance (ANOVA) were performed to examine the basic associations between the clinical risk variable and potential covariates. The clinical risk variable was not significantly associated with age, marital status, education, or employment status. In addition, there were no significant differences among the clinical risk groups in the proportion of participants involved in current outpatient treatment. Groups also did not differ significantly in the proportion experiencing a first onset or recurrence of major depression.

However, clinical risk was associated with BDI scores, \(F(3, 70) = 3.74, p < .05\), and HRSD scores, \(F(3, 70) = 2.99, p < .05\). Follow-up Tukey honestly significant difference tests revealed that, on the BDI, those with both anxiety and dysthymia comorbidity scored significantly higher than those with neither risk factor (\(M_s = 33.15, 25.79; SD_s = 7.88, 7.81; p < .05\)). Those with dysthymia alone or anxiety comorbidity alone fell in the middle and did not differ significantly from any other group (\(M_s = 32.75, 29.29; SD_s = 4.50, 9.96\)). The same pattern of results was found for HRSD scores. Those with both anxiety and dysthymia comorbidity scored higher, as a trend, than those with neither risk factor (\(M_s = 19.38, 15.49; SD_s = 4.57, 4.64; p = .06\)). Those with dysthymia alone or anxiety comorbidity alone did not differ significantly from any other group (\(M_s = 18.50, 18.21; SD_s = 5.29, 4.89\)). BDI scores were used as a covariate in the following analyses. All of the primary analyses were rerun using HRSD scores as a covariate, and the pattern of results was identical. Therefore, only results using BDI scores as the covariate are reported.

Demographic covariates associated with dependent and independent events. Preliminary one-way ANOVAs and chi-square analyses were also conducted to examine the relationship of age, marital status, education, employment status, and current treatment status to dependent and independent event threat. Two-tailed tests were used, but alpha levels were not corrected so that all possible covariates could emerge.

A significant negative correlation emerged between dependent event threat and age, \(r(72) = -.27, p < .05\), indicating that younger participants exhibited higher dependent event threat scores than older participants. In addition, although the omnibus test examining the association between dependent event threat and marital status was not significant, \(F(2, 71) = 1.82, p = .17\), follow-up orthogonal contrasts revealed that unmarried (\(M = 8.05, SD = 9.21\)) or divorced (\(M = 8.14, SD = 7.48\)) women had higher dependent event threat scores than married participants (\(M = 4.77, SD = 5.79\)). \(r(71) = 1.91, p = .06\). No other covariates, including current treatment status, were associated with dependent event threat. The only covariate associated with independent event threat was employment status, such that those who were unemployed had significantly higher independent event threat levels than those who were employed (\(M_s = 4.22, 1.96; SD_s = 5.12, 2.14\), \(r(72) = 2.68, p < .05\)).

All of the above significant demographic covariates were controlled for in the following relevant analyses, specifically, age and marital status for dependent event threat, and employment status for independent event threat.

Clinical Risk Factors and the Stress Generation Hypothesis

The mean cumulative threat scores for dependent and independent events experienced in the 6 months prior to depressive episode onset were 6.70 (\(SD = 7.47\)) and 2.66 (\(SD = 3.49\)), respectively. Adjusted means and standard errors of event threat by clinical risk group are presented in Table 2. Two one-way analyses of covariance (ANCOVA) were conducted to examine the relationship of clinical risk to dependent and independent event threat, respectively. To test an additive model, three planned orthogonal contrasts were specified for the clinical risk variable to compare (a) those with both anxiety comorbidity and dysthymia with those with either anxiety comorbidity or dysthymia or neither risk factor, (b) those with either anxiety comorbidity or dysthymia with those
with neither risk factor, and (c) those with anxiety comorbidity with those with dysthymia. Because these contrasts were orthogonal, alpha levels were not corrected, although two-tailed tests were used.\(^1\) BDI scores, marital status, and age were used as covariates in the model with dependent event threat. BDI scores and employment status were used as covariates in the model with independent event threat. Marital status and employment status were dichotomized for these analyses (0 = unmarried or divorced/separated, 1 = married; and 0 = unemployed, 1 = employed).

**Dependent event threat.** Clinical risk and the covariates of employment status and BDI scores accounted for 29% of the variance in dependent event threat. Age was a significant covariate in the model, \(F(1, 67) = 6.73, p < .05\). However, after including age in this full model, only marital status, \(F(1, 67) = 3.17, p = .08\), and BDI scores, \(F(1, 67) = 2.28, p = .14\), approached significance. Nevertheless, clinical risk was still significantly associated with dependent event threat in this model, \(F(3, 67) = 5.42, p < .005\), accounting for 20% of the variance (\(\eta^2 = .20\)). Follow-up orthogonal contrasts revealed that those with both anxiety comorbidity and dysthymia had higher dependent event threat scores than all other groups, \(t(70) = 3.75, p < .001\). By contrast, those with either anxiety comorbidity or dysthymia did not differ from those with neither clinical risk factor, \(t(70) = .96, p = .34\), and those with anxiety comorbidity and dysthymia did not differ from each other, \(t(70) = .18, p = .86\).

**Independent event threat.** Clinical risk and the covariates of employment status and HRS scores accounted for only 15% of the variance in independent event threat; this was almost entirely accounted for by the significant effect of employment status, \(F(1, 68) = 7.70, p < .05, \eta^2 = .10\). By contrast, BDI scores did not emerge as a significant covariate, \(F(1, 68) = .38, p = .54\). In addition, the clinical risk variable was not significantly associated with independent event threat, \(F(3, 68) = 1.54, p = .21\), accounting for only 6% of the variance (\(\eta^2 = .06\)). This was the case both before and after controlling for BDI scores and employment status.

Therefore, consistent with the stress generation hypothesis, those individuals with both comorbid anxiety and dysthymia experienced significantly higher levels of dependent event threat for events experienced in the 6 months prior to the onset of their index major depressive episode than those with one or the other of these clinical risk factors or those with neither risk factor. However, no evidence emerged to suggest an association between either of these clinical risk factors and levels of independent event threat. Most compelling is that the strength of the association between clinical risk and dependent event threat (\(\eta^2 = .20\)) explained over 3 times more variance than was explained by the nonsignificant relationship between clinical risk and independent event threat (\(\eta^2 = .06\)).

**Follow-up analyses including only full DSM–IV criteria for dysthymia.** Eight women in the dysthymia group did not meet the full temporal criteria for dysthymia specified in the DSM–IV. In other words, their dysthymia syndrome did not begin a full 2 years before the onset of their first major depressive episode. Therefore, we conducted follow-up analyses to determine whether the pattern of results obtained above differed when defining dysthymia in terms of strict DSM–IV criteria.

The distribution of participants in the clinical risk groups was now as follows: (a) no comorbid anxiety or dysthymia (\(n = 44\)); (b) full DSM–IV criteria dysthymia (\(n = 3\)); (c) comorbid anxiety (\(n = 17\)); and (d) both comorbid dysthymia (full DSM–IV criteria) and comorbid anxiety (\(n = 10\)). As described in Table 3, the pattern of means among the clinical risk groups was nearly identical to those reported in the previous analyses. Two one-way ANCOVAs were performed to examine the relationship of this new clinical risk variable to dependent versus independent event threat. After controlling for age, \(F(1, 67) = 6.98, p < .05\); marital status, \(F(1, 67) = 4.65, p < .05\); and BDI scores, \(F(1, 67) = 95, p = .33\), clinical risk was still significantly associated with dependent event threat, \(F(3, 67) = 5.02, p < .005\). Clinical risk accounted for 18% of the variance in this model (\(\eta^2 = .18\)). Follow-up orthogonal contrasts revealed that those with both anxiety comorbidity and dysthymia had higher dependent event threat scores than all other groups, \(t(70) = 3.35, p < .001\). By contrast, those with either anxiety comorbidity or dysthymia did not differ from those with neither clinical risk factor, \(t(70) = .63, p = .53\), and those with anxiety comorbidity and dysthymia did not differ from each other, \(t(70) = .57, p = .57\).

By contrast, after controlling for employment status, \(F(1, 68) = 6.09, p < .05\), and BDI scores, \(F(1, 68) = .12, p = .74\),

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\(^1\) The distributions of event threat were positively skewed due to the presence of several cases with zero or few events. Therefore, the following analyses were rerun using a Poisson transformation. The results using the transformed distributions did not differ from those conducted without the transformation. For ease of interpretation, only the untransformed results are presented.
Table 3
Adjusted Means and Standard Errors of Dependent and Independent Event Threat by Clinical Risk Group, Including Full DSM–IV Criteria for Dysthymia

<table>
<thead>
<tr>
<th>Event threat</th>
<th>Group 1: Major depression alone (n = 44)</th>
<th>Group 2: Comorbid anxiety (n = 17)</th>
<th>Group 3: Comorbid dysthymia (n = 3)</th>
<th>Group 4: Comorbid anxiety + dysthymia (n = 10)</th>
<th>Planned group comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>M</td>
<td>6.10</td>
<td>4.39</td>
<td>4.92</td>
<td>13.80</td>
<td>4 vs. 1, 2, 3*</td>
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<tr>
<td>SE</td>
<td>1.02</td>
<td>1.65</td>
<td>3.97</td>
<td>2.08</td>
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<tr>
<td>Independent</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>3.70</td>
<td>1.41</td>
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</tr>
<tr>
<td>SE</td>
<td>.52</td>
<td>.84</td>
<td>2.00</td>
<td>1.08</td>
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</table>

Note. ns = nonsignificant.
*p < .001.

clinical risk was not significantly associated with independent event threat, F(3, 68) = .80, p = .50. Clinical risk accounted for only 3% of the variance (r² = .03) in this model. This was the case both before and after controlling for BDI scores and employment status.

Therefore, when only those meeting full DSM–IV syndromal criteria for dysthymia were included, the stress generation hypothesis was still supported. Furthermore, an interactive relationship was still obtained, such that those with both comorbid DSM–IV dysthymia and anxiety had significantly higher dependent event threat scores than those with comorbid dysthymia alone, comorbid anxiety alone, or neither risk factor.

Descriptive Follow-Up Analyses: Dependent Events and Clinical Risk

Contrary to hypotheses, the relationship between clinical risk and dependent event threat was not additive. Instead, those with both anxiety and dysthymia comorbidity had higher levels of dependent event threat than all other groups, which themselves did not differ. In an effort to understand in a more fine-grained manner this interaction effect, we sought to descriptively characterize the stressful environments of those in the double-risk group (i.e., those with both dysthymia and anxiety comorbidity) along with those in either of the single-risk groups.

First, although not statistically significant, women in the double-risk group were more likely to experience severe dependent events, χ²(3, N = 74) = 6.38, p = .09, than women in the other clinical risk groups. Severe events are defined as the top two points on the LEDS scale of contextual threat; these events have been found to be most strongly associated with the onset of major depression in a number of studies (see Brown, Bifulco, & Harris, 1987; Brown & Harris, 1978). Specifically, 54% of participants in the double-risk group experienced severe dependent events versus 14%, 12%, and 30% in the anxiety, dysthymia, and neither risk factor groups, respectively. Therefore, consistent with the primary analyses conducted above, women in the double-risk group appeared to experience more threatening environments characterized by events of greater severity than women in any of the other three groups.

Second, descriptions of the actual dependent events experienced by the women in the present sample highlight the disrupted environments experienced by those with both comorbid anxiety and dysthymia in the 6 months prior to index episode onset. For example, Ms. L, an 18-year-old unmarried woman diagnosed with dysthymia and panic disorder, had the power cut off and was then evicted from her apartment, lost two of her closest friends due to a conflict, was jailed twice (for 1 and 3 days, respectively) related to her boyfriend’s drug activities, and then ended her long-standing relationship with this man. Ms. B, a 35-year-old unmarried woman diagnosed with both dysthymia and panic disorder, caused a serious car accident, fled the state with her boyfriend, and was then arrested for complicity in her boyfriend’s illegal activities. Ms. S, a 45-year-old unmarried woman with panic disorder and dysthymia, moved, quit her job, and was evicted from her apartment. The patterns exemplified by these women’s experiences involve multiple, additive events occurring in the relatively short 6-month period prior to onset. Those individuals with either anxiety or dysthymia comorbidity appeared to have far fewer, and less threatening, dependent event experiences in this time period. For example, Ms. D, a 31-year-old woman with posttraumatic stress disorder, had a conflict with her roommate, after which her roommate moved out. Ms. F, upon starting a new job, experienced verbal abuse by her boss. Although these experiences were no doubt very distressing, they did not occur in the context of multiple additional events, as was the case for the women in the double-risk group.

By contrast, the nature of the independent events did not differ among the groups. Most of these events involved primarily health events happening to other people. For example, one woman in the double-risk group had a son diagnosed with attention-deficit/hyperactivity disorder, her 19-year-old daughter became pregnant, and a friend committed suicide. Similarly, one woman in the group with comorbid anxiety had a son diagnosed with scoliosis, her mother was diagnosed with cancer, and her 23-year-old daughter was diagnosed with substance abuse. These independent events were typical of those experienced by participants in all four clinical risk groups.

Discussion

The present study tested the hypothesis that two clinical risk factors—comorbid anxiety and dysthymia—would be associated with an increased level of events that were at least partly dependent on the behavior or characteristics of the individuals themselves but would not be associated with an increased level of
independent events. Consistent with this stress generation hypothesis, the presence of both comorbid anxiety and dysthymia was associated with a higher level of dependent event threat in the 6 months prior to index episode onset, whereas these clinical risk factors were not associated with a higher level of independent event threat. This relationship held even after controlling for overall depression severity and the demographic risk factors of age, marital status, and employment status.

These results are consistent with those of Daley et al. (1997); as such, they provide converging support for the stress generation hypothesis. They also extend previous findings in important ways. The most compelling result of the present study was the strong effect of both anxiety and dysthymia comorbidity on event threat. We predicted that the relationship of clinical risk to dependent events would be additive, with higher levels of dependent events associated with each increasing level of clinical risk. Instead, those with both anxiety and dysthymia comorbidity experienced significantly higher dependent event threat scores than all other groups. By contrast, those with either anxiety or dysthymia comorbidity did not differ from those with neither risk factor.

Although the results of the present study leave open the question of the mechanism mediating stress generation in this double-risk group, there are a number of possible explanations for this finding.

1. The presence of both anxiety disorders and dysthymia may seriously compromise these individuals' stress coping resources. Therefore, the types of minor daily hassles that happen to everyone may, in these individuals, spiral into more serious life events that then trigger depression.

2. These individuals may have preexisting temperamental and/or genetic diatheses that are associated with the development of higher rates of both anxiety disorder and dysthymia comorbidity and dependent life events (e.g., Kendler, Karkowski, & Prescott, 1999).

3. Individuals with both dysthymia and an anxiety disorder are suffering from a higher number and broader array of symptoms than those with only one or the other of these conditions. As a result, these individuals may be at increased risk for disruptions in occupational or interpersonal functioning (e.g., frequent work absences or avoidance of social contacts), which may eventually culminate in dependent life events (e.g., being fired from job, breakup in relationship). This latter possibility raises the intriguing suggestion that there is something unique about the co-occurrence of symptoms and anxiety and dysthymia, in particular, that leads to stress generation. For example, it is possible that the chronic low self-esteem seen in dysthymia coupled with the ruminative worry seen in the anxiety disorders may engender a particularly dependent personality style and excessive reassurance-seeking behavior, which may place a strain on interpersonal relationships. Indeed, reassurance seeking has been linked to the generation of dependent life events (Pothonoff et al., 1995). It would be very interesting to determine in future research whether reassurance seeking mediates the relationship between comorbid anxiety and dysthymia and stress generation, in particular. Regardless of the nature of the mechanism driving stress generation, however, the present results have important clinical implications. We suggest that this double-risk group should be targeted for more rigorous maintenance strategies that focus on stress coping skills.

The descriptive analyses provide support for higher levels of disruption in the lives of those with both anxiety and dysthymia comorbidity. Not only did this group exhibit higher levels of dependent event threat but they also were more likely to experience events that were severely threatening. Indeed, the case examples highlighted these women's disrupted environments, characterized by multiple events clustering one after the other, prior to the onset of their major depressive episodes. A particularly intriguing question following from these analyses involves determining whether the severe events generated by those with comorbid dysthymia and anxiety directly predict the future onset or recurrence of major depressive episodes.

An additional index of the dysfunction associated with stress generation was provided by the demographic profiles of those participants with increased levels of dependent events. Younger age and unmarried status were associated with higher levels of dependent event threat. A number of other studies in the literature have found similar demographic risk factors to be associated with higher rates of life events (Brown & Moran, 1997; Hughes et al., 1988; Miller et al., 1986; Perris, 1984), and Miller et al. (1986) found that dependent events, in particular, were 4 times more common in their youngest age group. This association is not surprising given the greater participation of younger women in roles and activities likely to foster dependent events (e.g., romantic relationships, child-rearing, occupational activities, etc.). Furthermore, unemployment was significantly associated with higher levels of independent event threat, also consistent with Miller et al. (1986). On the face of it, this relationship appears inconsistent with the concept of an event independent of the behavior characteristics of the individual. Miller et al. (1986) suggest, however, that even ostensibly independent events may have been subtly influenced by the participant. In other cases in the present sample, it was clear that the unemployment status at the time of the interview was a result of a previous independent event. For example, one woman had quit her job prior to the study period to take care of her daughter who had been diagnosed with cancer. This woman then went on to experience a number of independent events related to her daughter's condition in the months preceding the onset of her index major depressive episode. Therefore, in this case, an independent event (daughter's cancer) caused this woman's unemployment, not vice versa. Note, however, that anxiety and dysthymia comorbidity continued to be significantly associated with dependent events even after controlling for age and marital status. Furthermore, anxiety and dysthymia comorbidity failed to evidence a significant association with independent event threat, both before and after controlling for employment status.

The present study was limited by its sample size. Future studies with larger samples will also permit the use of more complex statistical procedures to investigate the particular psychosocial dysfunctions (e.g., disrupted personality patterns or coping styles) that mediate the generation of life events in those with comorbid anxiety and dysthymia. Due to the small size of the present sample, not all participants had an onset of their dysthymia a full 2 years prior to their first major depressive episode. However, follow-up analyses, which included groups defined in terms of strict DSM-IV criteria, still supported the stress generation hypothesis, and the pattern of means was identical.

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2 We thank an anonymous reviewer for suggesting this hypothesis.
A second limitation of the present study is that participants were not selected systematically from the population but instead were volunteers responding to advertisements. Therefore, on the one hand, these women may not be entirely representative of the population of individuals with major depression; further investigation of the stress generation hypothesis using large-scale epidemiological samples is needed. On the other hand, a strength of this project is that participants were drawn from the community, as opposed to being drawn from treatment settings. This is important because research in the context of treatment outcome projects often excludes individuals with comorbid diagnoses. Therefore, the present group may represent a more naturalistic sample of the phenomenology of major depression. It is interesting that approximately half of the present sample was receiving some sort of outpatient treatment in the community for their depression, yet treatment status was not significantly associated with either dependent or independent event threat or the presence of comorbid anxiety or dysthymia. An interesting question for future research involves the role of ongoing treatment in moderating the effect of anxiety and dysthymia comorbidity in generating dependent events.

Note also that the present sample comprised women exclusively, similar to much of the work on stress generation (Daley et al., 1997; Hammen, 1991). However, Harkness et al. (1999) were able to replicate and extend the basic stress generation finding with a mixed sample of participants, suggesting that the present findings are likely to also generalize to men. Nevertheless, future work empirically demonstrating such generalizability is needed.

Because the present design was retrospective in nature, there exists the potential for mood-biased recall of the presence and severity of life events. Therefore, it could be that participants in the double-risk group in the present study were simply more likely to recall more negative dependent events because of their higher levels of symptomatology. The LEDS addresses this concern in a much better way than do traditional self-report questionnaire measures of life events (McQuaid, Monroe, Roberts, & Johnson, 1992). Specifically, independent judges, who were unaware of participants' symptom status and subjective reactions to events, rated each event according to factual indicators and contextual features. We also addressed this concern by assessing for potential clinical covariates (i.e., treatment status, number of previous episodes, and depression severity). As we reported, comorbid anxiety and dysthymia were still significantly associated with higher levels of dependent event threat, even after controlling for the significant effect of overall depression severity.

A further issue with our cross-sectional design is that we could not directly address the possibility that preexisting anxiety and dysthymia led to the generation of life events, which led directly to depression episode onset or recurrence. Although we proposed such a temporal model as an intriguing hypothesis to be addressed in future prospective work, our primary aim in this report was to undertake a detailed examination of the independent and additive effects of clinical risk factors on levels of dependent versus independent events. Nevertheless, one alternative explanation of the current findings is that the dependent life events caused the onset of anxiety disorders and dysthymia, as opposed to vice versa. This interpretation is unlikely, however, because both dysthymia and the anxiety disorders had to begin at least 6 months prior to the onset of the index major depressive episode (i.e., prior to any of the events assessed in the LEDS interview). Therefore, the present results argue more strongly for the reverse causal relationship: that is, the clinical dysfunction inherent in having a premorbid anxiety disorder and dysthymia generates dependent life events. The next step for research in this area involves a prospective study that follows a large sample of remitted depressed individuals to their next depression onset. Onset could then be predicted from anxiety and dysthymia diagnoses, and the presence of dependent versus independent events, during the study period.

The present project had a number of methodological and theoretical strengths, including the use of structured interviews to establish DSM-IV diagnoses and a state-of-the-art contextual interview and rating system to assess stressful life events. The advantages of the full LEDS approach to the definition and rating of life events have been extensively reviewed (e.g., McQuaid et al., 1992). Finally, from a theoretical perspective, this study posited a temporal model of the relationship between life events and clinical risk factors that may ultimately inform our understanding of the mechanism of recurrence in depression. This is potentially important clinical information, as it suggests a greater focus on maintenance interventions for individuals with significant comorbidity that pay particularly close attention to the role of life events in triggering recurrence. In particular, a greater clinical focus on cognitive and behavioral stress coping strategies may be warranted.

References


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