Temporal Variability in Global Self-Esteem and Specific Self-Evaluation as Prospective Predictors of Emotional Distress: Specificity in Predictors and Outcome

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Recent studies have found that temporal variability and reactivity in self-esteem (SE) are associated with risk for depressive symptoms subsequent to life stress. It is unclear, however, whether it is variability uniquely in SE that is critical, or whether variability in other domains, such as specific self-evaluation (SSE) and affect, would show similar effects. Further, the specificity of these effects to depression is unknown. In the present study, initially nondepressed women completed 7 daily ratings of SE, SSE, and affect. Over a 6-week prospective interval, the interactions of stressful life events and variability in both SE and SSE predicted changes in depression, particularly in individuals with more severe worst lifetime episodes of depressive symptoms. These effects were independent of average level of SE and SSE, as well as neuroticism and self-concept uncertainty. In contrast, variability in affect failed to predict changes in depression in interaction with life stress. Finally, none of the predictor variables interacted with stressful life events in predicting changes in anxiety.

Recent theory and research have suggested that dysregulation and variability in self-esteem (SE) contribute to vulnerability to depression (Roberts & Monroe, 1994, in press). In this regard, normal individuals appear to use cognitive, behavioral, and social mechanisms to self-regulate against negative affect (Kobak & Sceery, 1988; Morris & Reilly, 1987; Westen, 1994) and against threats to positive self-evaluation (Power & Brewin, 1990; Steele, 1988; Tesser, 1988). In contrast, depression-prone persons appear to experience deficits in these homeostatic mechanisms, which could contribute to the etiology of affective disorders (Rehm, 1988; Roberts & Monroe, in press). As a reflection of this dysregulation, heightened risk for depression has been hypothesized to be associated with global SE that is temporally unstable and highly reactive to daily life hassles (Barnett & Gotlib, 1988; Roberts & Monroe, 1994).

Results from recent studies that used daily measurements of SE have been consistent with this hypothesis. For example, in a previous investigation we found that temporal variability in SE moderated the depressogenic impact of an academic stressor (disappointment in performance on an important exam) in participants who were initially low in depressive symptomatology (Roberts & Monroe, 1992). Among these individuals, variability in SE was associated with greater increases in depressive symptoms subsequent to receiving disappointing grades. It is im-

portant to note that these effects held when absolute level of SE (i.e., high vs. low SE) was controlled. These findings were replicated in another recent study that used more comprehensive measures of life stress and a 2-month prospective interval (Roberts & Kassel, in press). Again, variability in SE was found to moderate the impact of life stress on changes in depressive symptoms. Consistent with the results of our first study, this effect was strongest in participants who were initially low in depressive symptomatology. Further, among these initially nondepressed individuals, variability in SE had a particularly powerful effect among those with a lifetime history of relatively more severe depressive experiences. Together, these two studies suggest that temporal variability in SE is associated with heightened risk for the development of depressive symptoms subsequent to life stress in nonclinical individuals who are vulnerable to more serious depressive symptoms.

To test whether vulnerability to depression is characterized by reactivity of SE in response to positive and negative events, Butler, Hokanson, and Flynn (1994) measured SE and daily events for 30 consecutive days. Using autoregression, Butler et al. calculated how well life events on each day predicted changes in SE for each participant. Individuals for whom life events predicted SE more strongly were considered more labile: Daily positive and negative events had a greater impact on their sense of self-worth. It is important to note that currently depressed and remitted depressives experienced greater lability than did never-depressed participants. Further, there was evidence from prospective analyses that labile SE moderated the depressogenic impact of life stressors. Participants who were more labile became more depressed following major stressful life events than did those who were less labile.

Although the results of these three studies offer consistent support for the formulation that variability and reactivity in SE are associated with vulnerability to depression, important questions remain. First, it is unclear whether the effects of vari-

ability in SE are specific to depression or are characteristic
of general psychological distress. Given the high comorbidity
between depressive symptomatology and anxiety (e.g., Gotlib &
Cane, 1989), it is important to examine whether variability
plays a similar role in each. Second, it is unclear whether it is
variability in global SE specifically that confers vulnerability to
symptoms of emotional distress, or whether variability in related
domains of self-evaluation, such as on relatively specific, self-
descriptive adjectives (e.g., foolish, generous, unfriendly),
might represent a similar vulnerability. Similarly, empirical evi-
dence suggests that variability in affect can moderate the impact
of daily stressors (DeLongis, Folkman, & Lazarus, 1988). On
the other hand, whereas Hall, Sing, and Romanoski (1991)
found affective variability to be elevated in depressed inpatients,
Cowdry, Gardner, O'Leary, Leibenluft, and Rubinow (1991)
found that depressed inpatients were more affectively stable
than were nondepressed persons, and Kernis, Grannemann, and
Barclay (1989) found that affective variability had different
consequences on anger arousal and hostility than did variability
in SE. Nonetheless, it remains possible that previous findings
that linked variability and reactivity of SE to depressive symp-
toms might have had relatively little to do with SE per se,
but instead resulted from more general affective dysregulation.
Finally, it is possible that SE variability might result from other
psychological characteristics, such as neuroticism and self-con-
cept uncertainty, which in turn mediate vulnerability effects.
Neuroticism is thought to reflect emotional instability (H. J.
Eysenck & Eysenck, 1964) and vulnerability to episodes of
depressive symptomatology (e.g., Roberts & Gotlib, 1997).
Likewise, uncertainty in self-concept has been associated with
variability in SE (Campbell, 1990). To argue that difficulties
in regulating SE play a role in the etiology of depressive symp-
tomatology, it is important to determine that the effects of vari-
ability in SE are not accounted for by these other conceptually
related factors.

We addressed these issues in the present study. We excluded
individuals from participation who were depressed at the begin-
ning of this study, both because we were interested in predicting
the onset of symptoms and because the results of our previous
studies indicated that the effects of variability in SE are stronger
in initially nondepressed persons (Roberts & Kassel, in press;
Roberts & Monroe, 1992). Thus, on the basis of their responses
to the Inventory to Diagnose Depression (IDD; Zimmerman,
Coryell, Corenthal, & Wilson, 1986) during group prescreening
sessions, we selected individuals who did not meet symptom
criteria from the *Diagnostic and Statistical Manual of Mental
Disorders,* third edition, revised, (*DSM–III–R;* American Psy-
chiatric Association, 1987) for major depression (see Method
section). Further, to make the sample as homogeneous as possi-
ble, only women were selected as participants. We selected
women because they are at greater risk for experiencing depres-
sion than are men (Nolen-Hoeksema, 1987) and because there
is evidence that the effects of variability in SE are somewhat
stronger in women than they are in men (Roberts & Monroe,
1992).

We hypothesized that variability in SE and specific self-evalu-
ation (SSE), in interaction with life stress, would prospectively
predict changes in depressive symptoms and anxiety after con-
trolling both for average level of SE and SSE and for neuroticism

and self-concept uncertainty. Although the hypothesis that vari-
ability in SE and variability in SSE act as diatheses was derived
from theory and research in the area of depression (e.g., Got-
lib & Hammen, 1992; Roberts & Monroe, 1994), the high de-
gree of comorbidity between depressive symptomatology and
anxiety leads one to expect similar effects for each. Variability
in affect was examined on an exploratory basis. On the basis
of findings from our previous study (Roberts & Kassel, in
press), we predicted that vulnerability effects would be stronger
in individuals with more severe worst lifetime depressive experi-
ences. We also predicted that severity of previous depression
would be associated with greater variability in SE and SSE.
Finally, we tested whether depletions in SE mediate the interac-
tion of variability in SE and life stress in predicting the onset
of symptomatology.

Method

Participants

Participants were 122 female undergraduate students enrolled in intro-
ductory psychology courses at Northwestern University. Although these
women were selected on the basis of reporting current low levels of
depressive symptomatology during group prescreen testing sessions, ap-
proximately half of these participants (in the final sample, $n = 41$) were
selected because they met *DSM–III–R* symptom (but not necessarily
duration) criteria for a previous depressive episode. Twenty-seven indi-
viduals failed to comply with instructions concerning daily ratings and
are not included in subsequent analyses, whereas 2 persons failed to
complete ratings of self-concept uncertainty. One additional individual
was excluded because she developed a depressive episode between the
prescreen testing session and the beginning of the study, leaving a final
sample of 92. Individuals participated in two in-laboratory sessions as
part of a course requirement and were paid $5 for completing six daily
ratings at home.

Overview

Participants were administered a battery of questionnaires early in the
academic quarter (Session 1) and were instructed to complete daily
measures of self-evaluation, confidence about the accuracy of self-rat-
ings, and affect over the next 6 days. Daily measures were returned
through campus mail each day after completion. Participants were told
that they needed to complete all daily ratings on time to receive payment.
These ratings, combined with ratings on identical measures at Session
1, yielded a total of seven daily assessments. Participants who completed
fewer than four daily assessments on time were dropped from the study
($n = 27$). Eleven individuals completed four to six assessments. Partici-
pants returned for a final session (Session 2) 6 weeks after Session 1.
At this time, they completed another packet of questionnaires, including
measures of life events and symptomatology, and they were debriefed.
Consistent with previous research (e.g., Kernis et al., 1989; Roberts &
Monroe, 1992), variability in each daily measure was operationalized
as within-participant standard deviation scores across the daily assess-
ments, whereas average level was operationalized as the mean score
across the seven daily assessments.

Measures

IDD. The IDD (Zimmerman, et al., 1986) is a 22-item questionnaire
that was used to assess severity of depressive symptoms as well as to
determine whether participants met *DSM–III–R* symptom criteria for
major depressive disorder. When treated as a continuous measure of

severity, the IDD correlates highly with the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Hamilton Rating Scale (Hamilton, 1967; Zimmerman et al., 1986). Other studies that were based on college students reported mean scores on the IDD between 11.2 and 13.0 (Roberts & Gotlib, in press; Roberts & Kassel, in press). In the present sample, coefficient alpha was .66 at Session 1 and .80 at Session 2. The IDD—Lifetime (IDD–L; Zimmerman & Coryell, 1987) was used to assess the severity of participants' worst lifetime experience of depression. The IDD–L consists of the same 22 items as the IDD. However, items are answered in terms of the most depressed week of an individual's life. Coefficient alpha was .85. Previous studies reported mean scores on the IDD–L between 24.4 and 27.5 in nonclinical samples (Roberts & Gotlib, 1997; Roberts & Kassel, in press).

State anxiety. Participants completed the 20-item state version of the State–Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) at both Sessions 1 and 2. Other studies using this measure with nonpatient control participants reported mean scores between 30.9 and 36.3 (M. W. Eysenck, Mogg, May, Richards, & Mathews, 1991; MacLeod, Mathews, & Tata, 1986). Coefficient alphas were .94 at Session 1 and .93 at Session 2.

Global SE. The Rosenberg Self-Esteem Scale (Rosenberg, 1979) is a 10-item scale designed to measure global SE (e.g., "On the whole, I am satisfied with myself"). To better capture daily fluctuations in self-evaluation, we instructed participants on this measure to rate how they felt about themselves "at the present moment" on 7-point Likert scales (1 = *strongly agree,* 7 = *strongly disagree*). In the current sample, coefficient alphas for this measure ranged from .82 to .92 across the seven daily assessments (M = .89).

SSE. To measure SSE, we created an inventory of 15 bipolar trait adjectives (e.g., kind–unkind, foolish–wise, smart–stupid, unfriendly–friendly, capable–incapable), drawing on adjectives used by J. D. Brown and Mankowski (1993). Poles were anchored at 1 (*capable*) and 7 (*incapable*). Participants were instructed to indicate how they viewed themselves at the present moment by circling the appropriate number. Dimensions were reverse-scored where appropriate such that higher scores reflected more positive self-evaluation. Coefficient alphas ranged from .83 to .94 across the seven daily evaluations (M = .90).

Confidence in self-evaluation. Participants indicated their confidence in the accuracy of each of the 15 bipolar ratings of SSE (1 = *not at all confident,* 5 = *very confident*). These confidence ratings were summed to provide an overall score for each assessment period and were aggregated across the seven daily assessments. Coefficient alphas ranged from .90 to .95 (M = .93).

Affect. A modified version of the Multiple Affect Adjective Checklist (MAACL; Zuckerman, Lubin, & Rinck, 1983) was used to assess depressed affect (DA). Twelve depressed-content adjectives were selected from the full MAACL on the basis of their factor loadings (Zuckerman et al., 1983). The Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) consists of two 10-item scales. Positive affect (PA) measures the extent to which a person feels active, enthusiastic, and engaged, whereas negative affect (NA) measures the extent to which a person experiences distressing emotions, such as anger, disgust, guilt, and fear. For all three scales (DA, NA, PA), participants indicated how well each adjective described how they currently felt using 5-point scales (1 = *very slightly or not at all,* 5 = *extremely*). Average coefficient alphas over the seven baseline evaluations were .92 for PA (range: .88–.95), .87 for NA (range: .83–91), and .92 for DA (range: .87–.94).

Neuroticism. The Eysenck Personality Inventory (H. J. Eysenck & Eysenck, 1964) was completed by all introductory psychology students during mass testing sessions that took place 1 to 2 weeks prior to Session 1. The Neuroticism Scale consists of 24 items, and had a coefficient alpha of .79 in the entire participant pool.

Stressful life events. A modified version of the List of Threatening Events Questionnaire (LTE-Q; Brugha, Bebbington, Tennant, & Hurry, 1985; Brugha & Cragg, 1990) was used as a measure of stressful life events. This inventory was developed to assess the types of life experiences found to be critical in triggering depression using Brown's interview-based approach (G. W. Brown & Harris, 1978). The LTE-Q has good test–retest reliability for events occurring over a period of 6 months (kappa = .78–1.0 on each of the 12 event categories except "something you valued was lost or stolen," kappa = .24), high agreement between participant and informant ratings (kappa = .70–.90), as well as good agreement with G. W. Brown's interview-based ratings (sensitivity = .89, specificity = .74 for a 6-month period; Brugha & Cragg, 1990).

We added four events that were believed to be particularly relevant to our sample of college students (e.g., failed an important exam, parents got divorced or separated). Participants were instructed to indicate which events occurred during the 6-week interval between Session 1 and Session 2 and then to rate the degree to which the event was upsetting (1 = *did not happen,* 2 = *happened but was not upsetting,* 3 = *happened and was somewhat upsetting,* 4 = *happened and was moderately upsetting,* 5 = *happened and was extremely upsetting*). The possible range of scores on this modified instrument was 16 to 80.

Results

Descriptive Statistics

Participants' average age was 18.7 (SD = 1.3) years with a range from 17 to 27. Table 1 presents the means and standard deviations of the central variables, as well as their correlation matrix. IDD scores at Sessions 1 and 2 were moderately correlated, r = .56, p < .001, and they were not significantly different from each other, t(91) < 1. Similarly, average state anxiety scores at Sessions 1 and 2 were also moderately correlated, r = .47, p < .001, and were not significantly different from each other, t(91) < 1. It is interesting to note that the five measures of variability ranged widely in their degree of association (rs ranged from .13 to .58), indicating that they likely assess different underlying constructs and, therefore, might demonstrate different relations with depressive symptomatology and anxiety.

Confidence in the accuracy of self-ratings was negatively correlated with variability in SE, SSE, DA, and NA, as well as with symptoms of depression, anxiety, and neuroticism. Individuals who were more confident about their self-ratings tended to be less symptomatic and more stable in their levels of negative moods and global SE over time. In contrast, confidence was positively correlated with variability in PA: Individuals who were more confident about their self-ratings tended to be more temporally variable in PA. Neuroticism was associated with higher levels of depressive symptoms and anxiety, as well as with variability in SE, DA, and NA.

Predictors of Severity of Worst Lifetime Episode of Depressive Symptomatology

As can be seen in Table 1, variability in DA (r = .34) and NA (r = .31), as well as confidence in the accuracy of self-ratings (r = −.25) and neuroticism (r = .34), were all significantly correlated with the severity of participants' worst lifetime episode of depressive symptomatology. Individuals with greater temporal variability in DA and NA, individuals with greater neuroticism, and individuals who were less confident in their self-ratings reported more severe previous experiences of de-

Table 1
Means, Standard Deviations, and Correlation Matrix of Central Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	M	SD
1. IDD at Session 1														9.36	4.55
2. IDD at Session 2	.56													9.07	6.02
3. IDD–L	.31	.45												23.50	10.72
4. Anxiety at Session 1	.51	.26	.15											39.19	11.88
5. Anxiety at Session 2	.25	.44	.35	.47										39.74	11.67
6. Life stress	.13	.16	.20	.13	.18									20.09	2.99
7. VSE	.07	.13	.05	.23	.20	−.11								4.41	2.39
8. VSSE	.15	.38	.09	.10	.13	.01	.44							5.88	3.81
9. VDA	.32	.33	.34	.60	.46	.13	.34	.35						3.58	3.27
10. VNA	.28	.38	.31	.50	.48	.22	.36	.40	.58					3.86	2.45
11. VPA	.16	.10	.05	.01	−.07	.16	.13	.26	.21	.31				6.27	2.37
12. Confidence	−.22	−.37	−.25	−.49	−.39	−.06	−.30	−.22	−.44	−.34	.22			59.41	8.31
13. Neuroticism	.38	.35	.34	.46	.46	.08	.21	.11	.47	.38	.07	−.33		11.82	4.48

Note. IDD = Inventory to Diagnose Depression; IDD–L = Inventory to Diagnose Depression—Lifetime; VSE = variability in global self-esteem; VSSE = variability in specific self-evaluation; VDA = variability in depression affect; VNA = variability in negative affect; VPA = variability in positive affect. $p < .05$ for correlations greater than .21. $p < .01$ for correlations greater than .26. $p < .005$ for correlations greater than .29. $p < .001$ for correlations greater than .35.

pressive symptomatology. Partial correlations (*prs*) were conducted to control for concurrent levels of depressive symptoms. Controlling for Session 1 depression, variability in DA ($pr = .26, p < .05$) and NA ($pr = .24, p < .05$), as well as neuroticism ($pr = .25, p < .05$) continued to be significant predictors of severity of previous depression, whereas confidence in self-ratings showed a trend toward significance ($pr = −.20, p < .06$).

Prospective Prediction of Onset of Depressive Symptoms and Anxiety

We used setwise hierarchical regression analyses (Cohen & Cohen, 1983) to test whether variability of SE, SSE, and affect predicted changes in depressive symptoms and anxiety, either on their own or in interaction with stressful life events and previous depression. In each of these analyses, we entered initial symptomatology (depression or state anxiety) at Step 1 and used Session 2 symptomatology as the criterion variable. Thus, remaining variables predict *residual change* in symptoms (Cohen & Cohen, 1983). In addition, Step 1 included severity of worst lifetime episode of depression and Session 1 and Session 2 anxiety (when the criterion variable was depression) and depression (when the criterion variable was anxiety). This latter procedure allowed us to test whether subsequent variables in the model predicted variance that was unique to depression or anxiety, providing a rigorous test of specificity (cf. Hankin, Roberts, & Gotlib, in press). We entered the set of main effects of neuroticism and confidence at Step 2, and we entered average level and variability in SE, SSE, DA, NA, and PA, each in separate analyses, as well as life stress at Step 3. We entered the set of all relevant two-way interactions (including the theoretically important Variability × Life Stress interactions) at Step 4, and at the final step, we entered the triple interaction of variability, life stress, and severity of worst lifetime depression. This triple interaction tested whether the severity of previous depressive experiences modified the relation between the Variability × Life Stress interactions and subsequent symptoms, as

our previous data suggested (Roberts & Kassel, in press). Results for analyses of changes in depressive symptoms (controlling for changes in anxiety) are reported in Table 2.

Variability in global SE. In terms of the control variables, neuroticism was not a significant predictor of changes in depressive symptoms, but confidence in self-ratings was negatively associated with the development of symptoms, $t(85) = 2.72, p < .01, pr = −.28$. Although the main effect of variability in SE failed to make a significant contribution to the prediction of changes in depressive symptoms, the two-way interaction of stressful life events and variability significantly predicted residual change in depressive symptomatology, $t(79) = 2.03, p < .05, pr = .22$. This interaction, however, was qualified by a significant three-way interaction of stressful life events, variability, and severity of worst lifetime depression, $t(78) = 2.91, p < .005, pr = .31$.[1] This triple interaction was decomposed statistically by conducting a median split on the severity of participants' worst lifetime depression and analyzing the Variability × Life Stress interaction within each group separately. Significant two-way interactions were further decomposed by conducting a median split on life stress and examining the univariate effects of variability in each group separately.

For participants with relatively minor worst lifetime episodes

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[1] A more conservative analysis was conducted to determine whether variability in SE continued to interact with stressful life events after statistically controlling interactions between level of SE and life stress and nonlinear trends in each of the interactions' component terms (Cohen & Cohen, 1983; Lubinski & Humphreys, 1990; see Roberts & Monroe, 1992 for a recent application), as well as the other control variables (neuroticism, confidence). It is important to note that the two-way interaction of variability in SE and life events, $t(73) = 2.90, p < .005, pr = .32$, and the triple interaction of variability in SE, life events, and previous depression, $t(71) = 2.23, p < .05, pr = .26$, remained significant after controlling for aggregate level of SE, two-way interactions involving level of SE, nonlinear relations, as well as neuroticism and confidence. In contrast, the two-way and triple interactions involving aggregate level of SE were not significant.

Table 2
Regression Analyses Predicting Session 2 Depressive Symptomatology

		Average level and variability measure used in regression equation								
		SE		SSE		DA		NA		PA	
Step	Set and predictor	R^2 change	pr	R^2 change	pr	R^2 change	pr	R^2 change	pr	R^2 change	pr
1	Main effects:	.4721****		.4721****		.4721****		.4721****		.4721****	
	IDD at Session 1		.50****		.50****		.50****		.50****		.50****
	IDD-L		.26*		.26*		.26*		.26*		.26*
	SA at Session 1		-.18		-.18		-.18		-.18		-.18
	SA at Session 2		.34**		.34**		.34**		.34**		.34**
2	Main effects: Control variables	.0430*		.0430*		.0430*		.0430*		.0430*	
	Neuroticism		.02		.02		.02		.02		.02
	Confidence		-.28**		-.28**		-.28**		-.28**		-.28**
3	Main effects: Stress, level, variability	.0022		.0530*		.0040		.0424		.0087	
	Average level		.03		.05		.00		.23*		.04
	Variability		.04		.31***		.06		.00		.12
	Life stress		.05		.06		.05		-.04		.02
4	Two-way interactions	.0788***		.0398		.0206		.0038		.0078	
	Life Stress × Variability		.22*		.28*		-.11		-.01		.08
	Life Stress × IDD-L		.10		.05		.12		.04		.07
	IDD-L × Variability		.27*		.05		.19		.09		-.10
5	Three-way interaction	.0395***		.0397***		.0019		.0061		.0004	
	Life Stress × Variability × IDD-L		.31***		.32***		-.06		-.12		.03

Note. IDD = Inventory to Diagnose Depression; IDD-L = Inventory to Diagnose Depression—Lifetime; SA = state anxiety; SE = self-esteem; SSE = specific self-evaluation; DA = depressive affect; NA = negative affect; PA = positive affect.
* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

of depressive symptomatology, the Variability × Life Stress interaction was nonsignificant, $t(35) < 1, pr = .10$. In contrast, for participants who had experienced relatively severe lifetime episodes, this interaction showed a trend toward significance in predicting residual change in depressive symptomatology, $t(35) = 2.01, p < .06, pr = .32$. Follow-up analyses indicated that variability had a more negative impact on participants who reported high levels of stress, $t(16) = 1.95, p < .07, pr = .44$, than it did on individuals who reported low levels of stress, $t(14) < 1, pr = -.07$. Thus, variability in SE acted as a diathesis primarily in women with relatively severe previous episodes of depressive symptomatology.

With respect to the prediction of changes in anxiety, variability in SE failed to make a significant contribution as a main effect or in interaction with life stress and severity of worst lifetime depression. However, neuroticism, $t(85) = 2.14, p < .05, pr = .23$, and average level of SE, $t(82) = 3.29, p < .005, pr = -.34$, were significantly correlated with changes in anxiety. Higher levels of neuroticism and lower levels of SE were prospectively associated with increases in anxiety.

Variability in SSE. The main effect of variability in SSE predicted residual change in depressive symptoms, $t(82) = 2.93, p < .005, pr = .31$. Participants with greater variability in SSE became more depressed over time. This main effect, however, was qualified by a significant interaction of Life Stress × Variability, $t(79) = 2.63, p < .05, pr = .28$, and a triple interaction of Life Stress × Variability × Severity of Worst Depression, $t(78) = 2.97, p < .005, pr = .32$.[2]

For participants with relatively less severe worst lifetime episodes of depressive symptomatology (on the basis of a median split), the Variability × Life Stress interaction was nonsignificant, $t(35) = 1.25, p > .20, pr = -.21$. In contrast, for participants with relatively severe worst lifetime episodes of depressive symptomatology, the Variability × Life Stress interaction made a significant contribution to the prediction of residual change in depressive symptoms, $t(35) = 3.01, p < .005, pr = .45$. Follow-up analyses indicated that variability had a more negative impact on participants who reported high levels of stress, $t(16) = 2.71, p < .05, pr = .56$, than it did on individuals with low levels of stress, $t(14) < 1, pr = .24$. Thus, similar to our findings with variability in SE, variability in SSE acted as a diathesis primarily in depression-prone persons.

In contrast to findings concerning depressive symptoms, variability in SSE failed to make a significant contribution to the prediction of changes in anxiety, either as a main effect or in interaction with stressful life events and severity of worst lifetime depression. However, lower levels of SSE were prospectively associated with increased in anxiety, $t(82) = 2.10, p < .05, pr = -.23$.

Variability in affect: DA, NA, and PA. Although level of NA prospectively predicted changes in depressive symptoms, $t(82) = 2.17, p < .05, pr = .23$, it was not associated with change in anxiety. Levels of DA and PA were not significantly associated with changes in symptoms of depression or anxiety. Variability in each of the three measures of affect (DA, NA, PA) failed to predict changes in depressive symptoms or anxiety. Similarly, the Variability × Life Stress interactions and the Variability × Life Stress × Severity of Worst Lifetime Depression

triple interactions also were nonsignificant predictors of changes in symptoms of depression and anxiety.

Mediation Analyses

Analyses were conducted to determine whether decreases in level of SE and SSE (from Session 1 to Session 2) mediated the relation between the triple interaction of Variable SE or SSE × Life Stress × Previous Depression and depressive symptoms (see Baron & Kenny, 1986). Failing to support the mediation hypothesis, the triple interaction involving variability in SE did not significantly predict residual change in SE. Furthermore, the magnitude of the triple interaction in predicting residual change in depression was not appreciably diminished after changes in SE were statistically controlled; in fact, the interaction was slightly larger ($pr = .33$ vs. $pr = .31$). Likewise, the triple interaction involving variability of SSE was not a significant predictor of residual change in SSE, and the magnitude of the triple interaction in predicting residual change in depression was not diminished after changes in SSE were statistically controlled ($pr = .31$ controlling for SSE changes vs. $pr = .32$ not controlling for SSE changes). Together, these findings suggest that decreases in the levels of global SE and SSE do not account for the association between variability in SE and SSE and the development of depressive symptoms following life stress.

Discussion

The current study clearly replicates the results of previous research, demonstrating that variability in SE acts as a diathesis for depressive symptomatology (Roberts & Kassel, in press; Roberts & Monroe, 1992). Those women who showed greater temporal variability in daily measures of global SE and SSE were more prone to developing depressive symptoms following stressful life events than were women with more stable levels of global SE and SSE. These findings also are consistent with a recent study by Butler et al. (1994) that demonstrated that SE in depression-prone individuals (i.e., currently and previously depressed persons) is highly reactive to daily life events and that such reactivity is prospectively associated with depressive outcomes following major life stressors. Together, these results strongly suggest that temporal variability and reactivity in how people view themselves are risk factors for depressive symptoms. However, it was unclear from these earlier studies whether other forms of temporal variability would show similar effects and, particularly in light of the high comorbidity of depression

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[2] We conducted a conservative analysis similar to the one reported in footnote 1. It is important to note that the main effect of variability in SSE, $t(81) = 2.94, p < .005, pr = .31$; the two-way interaction of variability in SSE and life stress, $t(73) = 2.20, p < .05, pr = .25$; and the triple interaction of variability in SSE, life stress, and IDD–L, $t(72) = 2.34, p < .05, pr = .27$, all remained significant after statistically controlling for aggregate level of SSE, two-way interactions involving level of SSE, nonlinear relations, as well as neuroticism and confidence. (However, the triple interaction involving aggregate level of SSE could not be entered simultaneously with the triple interaction involving variability because of multicolinearity.) In contrast, the main effect of aggregate level of SSE as well as the two-way and triple interactions involving aggregate SSE were not significant.

and anxiety, whether these effects were specific to depression or also pertained to other forms of psychological distress.

Perhaps the most provocative finding in the current study concerns the specificity of variability effects. Our data suggest that variability specifically in global SE and variability in SSE act as risk factors for depressive symptomatology in women. Women whose views of themselves tend to fluctuate a great deal from day to day have greater depressive reactions to stress than do those who maintain relatively stable self-views. In contrast, temporal variability in the various measures of affect used in the current study, including DA, NA, and PA, were not significantly related to changes in depressive symptoms. Although it is possible that different results would have been obtained in a patient sample, temporal variability in affect ("moodiness") failed to predict changes in depressive symptoms alone or in interaction with stressful life events in our nonclinical participants. Therefore, it appears that difficulties in maintaining a stable self-view from day to day, rather than moodiness, are associated with risk for developing depressive symptoms among nonclinical women. It is important to note that these effects were not due to highly variable participants simply being less certain about their self-ratings (cf. Baumgardner, 1990; Campbell, 1990) or having higher levels of neuroticism: The significant effects were maintained after confidence in the accuracy of self-ratings and neuroticism were statistically controlled. Given their association with future depressive symptomatology, variability in SE and SSE might represent fragile self-esteem (Barnett & Gotlib, 1988; Kohut, 1984; Roberts & Monroe, 1994) and a breakdown in important self-regulatory mechanisms (Rehm, 1988; Roberts & Monroe, in press).

In addition to demonstrating specificity in the predictor variable (global SE and SSE), the current study also found that vulnerability effects of variability were specific to depressive, as opposed to anxiety, outcomes. In fact, only the main effects of level of global SE, level of SSE, and neuroticism predicted changes in anxiety over time: Participants with lower levels of SE and SSE, as well as those with higher levels of neuroticism, tended to become more anxious. However, none of these measures moderated the impact of stressful life events. These null results were obtained despite our use of a widely used measure of anxiety (STAI; Spielberger et al., 1983) with high internal reliabilities at our two testing sessions (.94 and .93). Nevertheless, it is possible that different findings would have been obtained if we had assessed more enduring symptoms of anxiety than anxious mood state or if we had selected participants according to initial levels of anxiety rather than depressive symptomatology.

The current study replicates our earlier finding that variability in SE is a more potent diathesis in persons with relatively more severe previous episodes of depressive symptomatology than it is in those with relatively mild previous episodes (Roberts & Kassel, in press). Although we obtained significant two-way interactions between variability in self-evaluation (both global SE and SSE) and life stress, the triple interaction involving severity of worst lifetime episode of depressive symptomatology contributed unique variance to the prediction of changes in depressive symptoms over time. These findings suggest that temporal variability in SE and SSE might be indicators of risk for relapse or recurrence of episodes in remitted depressives when

under stress. Obviously, studies with clinically diagnosed remitted depressives are required to test this hypothesis more explicitly.

These findings concerning interactive effects with past depressive symptomatology have more general implications for depression research. It has become increasingly apparent that the relation between various vulnerability factors and depression can vary according to the clinical characteristics of the sample. For example, a number of studies have found that life stress shows different relations with subsequent depression as a function of initial level of depressive symptomatology (e.g., Cutrona, 1983; Hammen, Mayol, deMayo, & Marks, 1986; Monroe, 1982; Nolan, Roberts, & Gotlib, in press; Roberts & Monroe, 1992), which might reflect different processes associated with the onset versus the maintenance of these symptoms (Barnett & Gotlib, 1988; Depue & Monroe, 1986). In addition, other research suggests that life stress might have more serious consequences for persons with a previous history of depressive episodes than for never depressed individuals (Roberts & Kassel, in press; Russo, Vitaliano, Brewer, Katon, & Becker, 1995). Investigators need to be cognizant of the possibility that clinical characteristics, such as initial level of depressive symptomatology and severity of previous episodes, might modify the relations between vulnerability factors and depression. Had we not included severity of past depressive symptomatology in our statistical model, we would have obtained significant interactions between variability in SE or SSE and life stress, and we would have concluded that variability in SE and SSE acted as diatheses in our sample as a whole. Instead, we found that this effect was further modified by previous depression.

In terms of characteristics associated with previous depression, the present data suggest that higher levels of neuroticism and greater variability in DA and NA are correlated with more severe worst lifetime episodes of depressive symptomatology, even after statistically controlling for concurrent depressive symptoms. Because neuroticism and variability in DA and NA were not found to be prospective predictors of depressive symptoms, our data are more consistent with the possibility that these factors are consequences, or "scars," of previous episodes rather than vulnerability factors for future depressive symptoms. That is, neuroticism and affective variability do not appear to increase the risk for developing future depressive symptomatology; instead, they seem to result in part from the experience of previous episodes. We should note, though, that another recent study examining a variety of personality traits among clinically depressed individuals came to the opposite conclusion (Shea et al., 1996).

Future research needs to focus on delineating the underlying mechanisms by which variability in SE and variability in SSE operate to increase sensitivity to life stressors. Analyses on the current data do not support the idea that decreases in experienced self-worth (SE or SSE) mediate the relation between Variable SE or SSE × Life Stress × Severity of Previous Depression interactions and changes in depressive symptoms. Likewise, our previous two data sets also failed to demonstrate such mediation (see Roberts & Kassel, in press). Apparently, individuals with highly variable SE and SSE are not more prone to depressogenic plunges in self-worth following stressors than are more stable persons. Although it is not clear what mecha-

nisms and processes lead to increased susceptibility to depression in highly variable individuals, G. W. Brown and Harris (1978) suggested that loss of hope is a possible reason (see also Abramson, Metalsky, & Alloy, 1989). Maintaining an optimistic view of the future might require a stable image of the self. From a similar perspective, future research also might investigate those conditions in which variability might reflect healthy malleability and flexibility. For example, one previous study found that variability in SE acted as a stress buffer among individuals who were initially mildly depressed (Roberts & Monroe, 1992). Thus, it is possible that there is a threshold below which SE variability represents healthy malleability and above which it represents vulnerability to depression. It remains for future research to examine this possibility more systematically.

In summary, the current study suggests that temporal variability in global SE and variability in SSE are associated with increased risk for developing depressive symptoms in response to stressful life events, even after statistically controlling for level of SE and SSE and for neuroticism and self-concept uncertainty. In contrast, variability in DA, variability in NA, and variability in PA were unrelated to changes in symptoms, either alone or in interaction with life stress. Finally, attesting to the specificity of these findings to depressive symptoms, none of the predictor variables interacted with stressful life events in predicting changes in anxiety over time. Future research should focus on delineating the underlying mechanisms by which variability in self-evaluation confers risk for depressive symptoms.

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