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LEVEL AND STABILITY OF SELF-ESTEEM AS PREDICTORS OF DEPRESSIVE SYMPTOMS

John E. Roberts,[1] Jon D. Kassel[2] and Ian H. Gotlib[1]

[1]Department of Psychology, 102 Swift Hall, Northwestern University, Evanston, IL 60208 and
[2]Department of Psychology, University of Pittsburgh, Pittsburgh, PA 15260, U.S.A.

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Summary—In a recent study, Kernis, Grannemann and Mathis (*Journal of Personality and Social Psychology*, 61, 80–84) reported that stability of self-esteem (SE) moderates the relation between level of SE and depression. Specifically, level of SE predicted depression more strongly in persons with temporally *stable* SE. We attempted to replicate this finding across three independent data sets (total $N = 504$). Although level of SE was a strong prospective predictor of depressive symptoms in all three studies, in none were significant interactions obtained between level and stability of SE in the form suggested by Kernis and his colleagues. Overall, our results suggest that Kernis *et al.*'s finding is unreliable. Given recent theory suggesting that *in*stability in SE (Roberts & Monroe, *Clinical Psychology Review*, *14*, 161–181, 1994) and neuroticism (Martin, *Personality and Individual Differences*, *6*, 353–365, 1985) predispose to depression subsequent to life stressors, these findings are not surprising. Data are presented that demonstrate that stable SE and affect measured 'on-line' through daily assessments are, in fact, associated with lower levels of neuroticism.

INTRODUCTION

Over the past several years, Kernis and his colleagues have conducted an impressive series of studies documenting the importance of temporal *stability* of self-esteem (SE) as a psychological variable distinct from *level* of self-esteem. Whereas stability of SE refers to short-term fluctuations in SE over time, level of SE refers to whether SE is relatively high or low (usually at a single point in time). Stability of SE has been linked to anger arousal and hostility (Kernis, Grannemann & Barclay, 1989), excuse making (Kernis, Grannemann & Barclay, 1992), and defensiveness following negative feedback (Kernis, Cornell, Sun, Berry & Harlow, 1993). Overall, this body of research suggests that level of SE shows substantially different relations with psychological variables as a function of its stability.

Recently, Kernis, Grannemann and Mathis (1991) applied the distinction between level and stability of SE to the study of depression. Consistent with numerous other studies, low SE was associated with higher levels of depressive symptoms. This relation, however, was stronger in persons with stable SE. The Level × Stability of SE interaction was significant regardless of whether level of SE was measured by a single assessment (about four to five weeks prior to the measurement of depression), or by an aggregate of eight assessments. Importantly, this research suggests a possible explanation for why investigators frequently are unable to predict future depression or discriminate remitted depressives from never-depressed individuals on the basis of SE (e.g. Lewinsohn, Steinmetz, Larson, & Franklin, 1981; Lakey, 1988): low SE is an important risk factor only for those individuals who experience *chronically* low self-regard (i.e. stable, low SE).

The purpose of the present report was to replicate and extend Kernis, Grannemann and Mathis (1991) findings using data from three broader investigations of psychosocial vulnerability to depression. These data offer a unique opportunity to further examine the association between level and stability of SE in depression, particularly given that Kernis *et al.*'s results are based on a relatively small sample [$N = 76$; see Chaplin (1991)].

STUDY 1

At the beginning of this study, *S*s were given packets of questionnaires, including measures of self-esteem and depressive symptoms. These were completed three times per week during a

three-week baseline period, and then on three occasions during a one-week follow-up. Questionnaires were returned on days that the *S*s psychology classes met.

Method

Subjects

*S*s were 216 undergraduates at the University of Pittsburgh who participated in the study in exchange for course credit in their introductory psychology classes. Due to incomplete data, 24 *S*s were dropped from subsequent analyses, leaving a final sample of 192 *S*s (122 females).

Measures

Level of self-esteem. The Rosenberg Self-Esteem Scale [RSE (Rosenberg, 1965, 1979)] was used as a measure of global self-regard. Responses were made on four-point Likert scales (1 = strongly agree; 4 = strongly disagree). In order to parallel Kernis *et al.* (1991), level of SE was based on the first administration of the RSE, whereas average SE was the aggregate of the nine baseline assessments.

Instability of self-esteem. Instability was computed for each *S* as the standard deviation of his/her nine SE scores during the baseline. This procedure measures the actual degree of short-term fluctuation in SE over time (see Kernis *et al.*, 1989, 1991). In the current study, higher scores reflect greater *in*stability.

Kernis *et al.* (1991) measured what they labelled as Stability of SE in exactly the same manner (i.e. standard deviations of scores over time). Because standard deviations represent variability, we must assume that, if Kernis' high scores reflect greater stability, this scale was transformed in some manner.

Depressive symptomatology. The Beck Depression Inventory [BDI (Beck, Ward, Mendelson, Mock & Erbaugh, 1961)] was used to assess depressive symptoms. The BDI has been demonstrated to be a valid measure of depressive symptoms in college students (Bumberry, Oliver & McClure, 1978), and correlates well with ratings of depression severity made by independent clinicians (Beck, Steer & Garbin, 1988; see Gotlib & Cane, 1989, for a review of this literature). Our depression index consisted of an aggregate of three follow-up measures of the BDI taken over the course of one week.

Results and Discussion

Means and standard deviations for variables in all studies are presented in Table 1. As expected, level of SE ($r = -0.47$, $P < 0.001$) and average SE ($r = -0.57$, $P < 0.001$) were each negatively correlated with future depression. Instability was inversely related to both level of SE ($r = -0.31$, $P < 0.001$) and average SE ($r = -0.29$, $P < 0.001$), and was positively associated with depressive symptoms ($r = 0.33$, $P < 0.001$) That is, higher levels of instability were associated with lower SE and with higher levels of depression.

Major analyses were conducted using setwise hierarchical regression analyses (Cohen & Cohen, 1983). Separate analyses were conducted for level of SE and average SE as predictors of depression

Table 1 Means and standard deviation of variables

	Study 1		Study 2		Study 3	
Measure	*M*	SD	*M*	SD	*M*	SD
Self-esteem level	31.1	4.8	38.4	6.1	52.9	9.2
Self-esteem instability	2.1	1.4	3.1	1.8	4.1	2.2
Self-esteem average	31.4	4.8	40.0	5.7	55.1	10.0
BDI	5.4	6.1				
IDD			10.2	8.3	9.5	6.9
Neuroticism					11.9	4.4
Depressive affect instability					3.4	3.0
Positive affect instability					5.8	2.2
Negative affect instability					3.7	2.4

BDI, Beck Depression Inventory; IDD, Inventory to Diagnose Depression. Self-esteem was measured on a four-point scale in Study 1, a five-point-scale in Study 2, and a seven-point scale in Study 3. Mean scores of level of self-esteem, stability of self-esteem, and average self-esteem vary accordingly across the three studies.

Table 2. Summary of regression analyses predicting scores on the Beck Depression Inventory (Study 1)

Predictor	B	SE_B	F	P
Level	−0.51	0.08	37.47	<0.001
Instability	0.88	0.28	10.04	<0.01
Level × Instability	−0.10	0.05	4.06	<0.05
Model $R^2 = 0.27$, $F(3, 188) = 23.51$, $P < 0.001$				
Average	−0.66	0.08	72.97	<0.001
Instability	0.76	0.26	8.62	<0.01
Average × Instability	−0.16	0.04	15.29	<0.001
Model $R^2 = 0.41$, $F(3, 188) = 42.84$, $P < 0.001$				

B, Unstandardized regression coefficient; SE_B, standard error of B.

during follow-up. Level of SE (or average SE) and instability of SE were entered simultaneously in Step 1, and the Level of SE (or Average SE) × Instability of SE product term was entered into the model in Step 2. In these analyses, magnitude of effects are reported as partial correlations (*pr*'s).

As can be seen in Table 2, both level and stability of SE made significant unique contributions to the prospective prediction of depressive symptoms. Level of SE showed an inverse association with depressive symptomatology ($pr = -0.41$, $P < 0.001$), whereas instability showed a positive relation ($pr = 0.23$, $P < 0.01$). Most importantly, the interaction term (Level × Instability) also was significant ($pr = -0.15$, $P < 0.05$) Univariate analyses were conducted to further investigate this two-way interaction. *Ss* were divided into stable and labile groups based on a median split of instability, and the correlation of average SE and depression was examined in each group. In contrast to Kernis *et al.*'s (1991) findings, level of SE correlated as strongly with depression in the unstable ($r = -0.45$) as in the stable group ($r = -0.46$; $z = 0.09$, $P > 0.1$).

Likewise, average SE ($pr = -0.53$, $P < 0.001$) and instability ($pr = -0.21$, $P < 0.01$) both made unique contributions to the prediction of future depressive symptoms. Most importantly, the interaction term (Average × Instability) also was significant ($pr = -0.27$, $P < 0.001$). However, univariate analyses demonstrated that, if anything, average SE correlated with depression more strongly in the unstable ($r = -0.65$) than in the stable group ($r = -0.48$; $z = 1.72$, $P < 0.09$).

Kernis *et al.* (1991) raised the possibility that level and stability of SE might be related in a curvilinear manner and that this confound might account for their interaction. Specifically, extreme scores (high or low) are more likely to be stable than are moderate scores (see Paunonen, 1988; Tellegen, 1988). As in Kernis *et al.* (1991), this potential confound was tested by entering the square of SE scores prior to the interaction of average SE and instability of SE. The contribution of this squared component was significant after controlling for level of SE and instability of SE ($pr = 0.21$, $P < 0.01$), as well as after controlling for average SE and instability of SE ($pr = 0.34$, $P < 0.001$). Of most importance, the interaction terms (Level of SE × Instability of SE and Average SE × Instability of SE) were no longer significant in predicting depression after controlling for this curvilinear effect ($pr = -0.06$, $P > 0.1$ and $pr = -0.10$, $P > 0.1$, respectively).

In contrast to Kernis *et al.*'s (1991) findings, the results of Study 1 failed to demonstrate a stronger association between level of SE and depression in persons with stable SE. Further, the significant Level of SE × Stability of SE and Average SE × Stability of SE interactions apparently were due to a statistical artifact: extremity and variability of scores were confounded within the data (see Paunonen, 1988; Tellegen, 1988). These results might differ from Kernis *et al.*'s (1991) findings because of differences in frequency of sampling. Kernis *et al.* measured self-esteem twice daily for four days, whereas we measured SE three times a week for three weeks. Perhaps more frequent sampling would have led to a significant Level × Stability interaction in the form suggested by Kernis *et al.*

STUDY 2

In Study 2, SE was measured on a daily basis for one week. Daily reports were completed in the evening and were returned through campus mail the next day. The interval between the first assessment of SE and depressive symptoms was eight weeks.

Method

Subjects

Ss in Study 2 were 225 college students (142 female) at the University of Pittsburgh. Due to failure to return for the final session, as well as incomplete daily ratings, eight *Ss* were dropped from subsequent analyses. *Ss* participated in exchange for course credit.

Measures

Level and instability of self-esteem. As in Study 1, we utilized the Rosenberg Self-Esteem Scale (Rosenberg, 1965, 1979). However, in this study we employed a five-point Likert scale. Level of SE was based on the first administration of the RSE, whereas Average SE was the aggregate of the seven baseline assessments. Instability was computed for each *S* as the standard deviation of his/her seven SE scores during the baseline assessments.

Depressive symptomatology. The Inventory to Diagnose Depression [IDD (Zimmerman, Coryell, Corenthal & Wilson, 1986)] was used to assess severity of depressive symptoms. The IDD has good reliability and correlates highly with the BDI, as well as with the Hamilton Rating Scale (Zimmerman & Coryell, 1987; Zimmerman *et al.*, 1986).

Results and Discussion

Consistent with the results of Study 1, level of SE ($r = -0.39$, $P < 0.001$) and average SE ($r = -0.40$, $P < 0.001$) were both negatively correlated with future depressive symptoms. Instability was inversely related to both level of SE ($r = -0.21$, $P < 0.01$) and average SE ($r = -0.26$, $P < 0.001$), and was positively associated with depressive symptoms ($r = 0.17$, $P < 0.05$).

In the regression analyses displayed in Table 3, level of SE was a significant prospective predictor of depressive symptoms when instability of SE was controlled ($pr = -0.37$, $P < 0.001$). In contrast to Study 1, instability of SE failed to make a contribution independent of level of SE ($pr = 0.09$, $P > 0.1$). Importantly, the interaction of level and instability of SE was nonsignificant ($pr = -0.06$, $P > 0.1$). Likewise, average SE was a significant prospective predictor of depressive symptoms when instability was controlled ($pr = -0.37$, $P < 0.001$), but instability failed to make a unique contribution ($pr = -0.07$, $P > 0.1$). Of most interest, the interaction term between average SE and instability of SE was nonsignificant ($pr = 0.08$, $P > 0.1$).

Across Studies 1 and 2, results suggest that low SE is associated with higher levels of depression regardless of the stability of an individual's SE. These findings contrast with those of Kernis *et al.* (1991), who found that level of SE was a better predictor of depression in individuals with stable SE. How might we begin to understand this discrepancy? Interestingly, although Kernis *et al.*'s results are intuitively appealing, they run counter to recent theoretical perspectives of vulnerability to depression. In this regard, we have suggested that labile SE (i.e. SE that is temporally unstable and highly reactive to challenges, such as depressed mood and daily hassles) increases risk for depression subsequent to stressful life events (Barnett & Gotlib, 1988; Roberts & Monroe, 1992, 1994). Although our model does not imply an interaction between level and stability of SE, it does suggest that individuals who are *less* stable are at greater risk. Further, unstable SE can be conceptualized as a manifestation of neuroticism, a personality trait thought to measure affective reactivity and

Table 3. Summary of regression analyses predicting scores on the Inventory to Diagnose Depression (Study 2)

Predictor	B	SE_B	*F*	*P*
Level	−0.52	0.09	34.48	< 0.001
Instability	0.41	0.30	1.86	n.s.
Level × Instability	0.04	0.05	0.88	n.s.
Model $R^2 = 0.17$, $F(3, 213) = 14.14$, $P < 0.001$				
Average	−0.56	0.10	33.87	< 0.001
Instability	0.32	0.31	1.08	n.s.
Average × Instability	0.06	0.05	1.36	n.s.
Model $R^2 = 0.17$, $F(3, 213) = 14.13$, $P < 0.001$				

B, Unstandardized regression coefficient; SE_B, standard error of B.

dysregulation (Eysenck & Eysenck, 1985). Interestingly, neuroticism has been linked to vulnerability to depression both empirically (Boyce, Parker, Barnett, Cooney & Smith, 1991; Hirschfeld, Klerman, Lavori *et al.*, 1989; Kendler, Kessler, Neale, Heath, Phil & Eaves, 1993) and theoretically (Martin, 1985). As such, we would be surprised to find that *stable* SE (reflective of lower neuroticism) increased the depressogenic effect of low SE.

STUDY 3

Study 3 was conducted in order to confirm the findings from the previous two investigations, as well as to examine the relation between instability and neuroticism. In addition to SE, positive, negative, and depressed affect were measured on a daily basis for one week. Daily reports were completed in the evening and were returned through campus mail. The interval between the first assessment of SE and depressive symptoms was six weeks. *S*s participated in two laboratory testing sessions as part of a course requirement, whereas completion of daily ratings was voluntary. *S*s were paid $5.00 for returning daily ratings on time.

Method

Subjects

Subjects were 122 female college students at Northwestern University. For the purposes of another study, individuals who met Diagnostic and Statistical Manual—Third-Edition-R criteria for major depression (based on the IDD) during prescreening sessions were excluded. Due to incomplete data, 27 *S*s were dropped from subsequent analyses, yielding a final sample of 95.

Measures

Measures were identical to those of Study 2, except that the Rosenberg Self-Esteem Inventory was scored on seven-point Likert scales and the following instruments also were included:

Neuroticism. The Eysenck Personality Inventory [EPI (Eysenck & Eysenck, 1964)] was administered during mass testing sessions that took place one to two weeks prior to the first session of the current study.

Affective Instability. A modified version of the Multiple Affect Adjective Checklist [MAACL (Zuckerman, 1960)] was used to measure Depressed Affect (DA). Twelve depressed-content adjectives were selected from the full MAACL on the basis of their factor loadings (Zuckerman, Lubin & Rinck, 1983). *S*s indicated how well each adjective described how they currently felt on five-point scales (1 = very slightly or not at all; 5 = extremely). The Positive and Negative Affect Schedule [PANAS (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. *S*s completed these instruments on seven consecutive evenings. Instability in DA, PA, and NA was based on within-*S* standard deviation scores.

Results

Results of Study 3 were remarkably similar to the previous studies. Although instability in SE failed to achieve significance in predicting future depressive symptoms ($r = +0.15$, $P > 0.1$), level of SE ($r = -0.43$, $P > 0.001$) and average SE ($r = -0.48$, $P < 0.001$) were strong predictors. Also consistent with the results of Studies 1 and 2, instability was inversely related to both level of SE ($r = -0.46$, $P < 0.001$) and average SE ($r = -0.39$, $P < 0.001$)

In the regression analyses displayed in Table 4, level of SE was a significant predictor of future depressive symptoms when instability of SE was controlled ($pr = -0.41$, $P < 0.001$). However, instability failed to make a unique contribution ($pr = -0.06$, $P > 0.1$) and the Level of SE × Instability of SE interaction was not significant ($pr = 0.07$, $P > 0.1$). Similarly, average SE made a unique contribution when instability was controlled ($pr = 0.47$, $P < 0.001$), but not vice versa

Table 4. Summary of regression analyses predicting scores on the Inventory to Diagnose Depression (Study 3)

Predictor	B	SE_B	*F*	*P*
Level	−0.34	0.08	18.44	<0.001
Instability	−0.18	0.33	0.30	n.s.
Level × Instability	0.02	0.03	0.44	n.s.
Model $R^2 = 0.19$, $F(3, 91) = 7.13$, $P < 0.001$				
Average	−0.35	0.07	25.31	<0.001
Instability	−0.13	0.31	0.17	n.s.
Average × Instability	0.04	0.03	1.29	n.s.
Model $R^2 = 0.25$, $F(3, 91) = 9.83$, $P < 0.001$				

B, Unstandardized regression coefficient; SE_B, standard error of B.

($pr = -0.04$, $P > 0.1$). Again, average SE failed to interact with instability of SE in predicting depression ($pr = 0.12$, $P > 0.1$).

Finally, we suggested that Kernis *et al.*'s (1991) findings were inconsistent with theory that suggests that neuroticism is a risk factor for depression. We reasoned that *in*stability in SE would, in fact, be related to higher levels of neuroticism. Consistent with this hypothesis, neuroticism was positively correlated with instability in self-esteem ($r = 0.23$, $P < 0.05$), as well as with instability in NA ($r = 0.39$, $P < 0.001$) and DA ($r = 0.47$, $P < 0.001$), but not instability in PA ($r = 0.06$, $P > 0.1$). Neuroticism also was associated with lower level of SE ($r = -0.48$, $P < 0.001$) and average SE ($r = -0.53$, $P < 0.001$), as well as with greater depressive symptoms ($r = 0.32$, $P < 0.001$).

GENERAL DISCUSSION

Across three studies at two universities (total $N = 504$), we found that level of SE prospectively predicted depressive symptoms. However, in contrast to Kernis *et al.*'s (1991) findings, level of SE predicted future depressive symptoms irrespective of *S*s stability of SE. Low SE was associated with future depressive symptoms both in *S*s with relatively stable SE *and* in *S*s with unstable SE. We should note that in other analyses level of SE fared much less well in predicting *changes* in depressive symptoms over time (see Roberts & Gotlib, in preparation; Roberts & Kassel, in preparation; Roberts & Monroe, 1992). Taken together, these data suggest that Kernis *et al.*'s finding of a stronger relation between level of SE and depression in *S*s with stable SE is fragile and might have been due to chance. Importantly, our data also suggest that neuroticism and *un*stable SE are associated with future depressive symptomatology and, therefore, might represent vulnerability factors.

Although Kernis *et al.*'s (1991) finding that low SE is only associated with depression in individuals with chronic low SE was in some ways intuitively appealing, other theory and research suggests that *unstable* SE would be more detrimental. For example, temporally unstable, or labile, SE (as opposed to stable SE) has been found to act as a diathesis for depressive symptoms following stressful life events (Butler, Hokanson, & Flynn, 1994; Roberts & Gotlib, in preparation; Roberts & Kassel, in preparation; Roberts & Monroe, 1992). In these studies, individuals with labile SE experienced heightened risk for depressive reactions following stressful life events. Further, this effect appears to be independent of level of SE, which failed to act as a diathesis in these and other studies. Temporal instability in a construct so central as self-worth is likely related to fragmentation of self-concept (Donahue, Robins, Roberts & John, 1993) and to fragility of SE (Kernis *et al.*, 1989). Further, instability appears to be positively associated with neuroticism, a known risk factor for depression (e.g, Kendler *et al.*, 1993; Martin, 1985). In the current data, individuals who scored higher in neuroticism experienced greater variability in SE, DA, and NA measured on a daily basis for one week. Not only does this finding provide some validation of our on-line measures of instability in SE and affect, but it also suggests that, if anything, stability should be associated with emotional resilience and low levels of depressive symptoms.

In terms of integrating level and stability of SE, one conceptually appealing possibility is that depletions in level of SE mediate the association between temporal instability of SE and depressive symptoms. That is, following stressful life events, *S*s with labile SE experience a collapse in their self-worth, which in turn is responsible for the onset of depressive symptoms. Therefore, loss of

experienced SE (level of SE), would make the most proximal psychological contribution to depression. Although such a state of affairs implies that both level and stability of SE operate in the onset of depression, this process would not be reflected in a statistical interaction between these two constructs (see Baron & Kenny, 1986). Unfortunately, our data are generally inconsistent with this mediational model and, instead, suggest that depletions in SE make a direct contribution to the prediction of depression (see Roberts & Kassel, in preparation). Therefore, other mechanisms must contribute to the onset of depressive reactions in individuals with relatively unstable SE.

Future research should continue to delineate the underlying causes of temporal instability, including the possibility that dysregulation in critical biological systems (Depue, Krauss & Spoont, 1987; Depue & Iacono, 1989) contributes to fluctuations in SE, as well as to neuroticism (Eysenck & Eysenck, 1985). In this regard, it is also important to determine which aspects of instability are responsible for heightened risk for depression. For example, is instability in SE specifically associated with depression, or is instability in general (e.g. affective instability or instability on other self-attributes) associated with risk? Finally, it is unclear whether temporal instability of SE plays a role in clinical depression and is specific to symptoms of depression vs other forms of psychological distress. Future research needs to examine these processes in more severe, diagnosed depression, as well as in related psychiatric conditions, such as anxiety disorders.

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