Depressive Reactions to Failure in a Naturalistic Setting: A Test of the Hopelessness and Self-Esteem Theories of Depression

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We tested the hopelessness and self-esteem theories of depression and an integration of the two by examining whether a stable, global attributional style (attributional diathesis) and low self-esteem interacted with the outcomes students received on a midterm examination to predict their subsequent depressive reactions over the course of 5 days. Students' immediate depressive reactions (on receipt of grades) were predicted solely by the examination outcome, whereas their enduring depressive reactions during the following 4 days were predicted by the Attributional Diathesis × Low Self-Esteem × Failure interaction. The results also indicated that the three-way interaction predicted enduring depressive reactions through the mediating role of hopelessness.

Recently, Abramson, Metalsky, and Alloy (1989) proposed a revision of the reformulated helplessness theory of depression (Abramson, Seligman, & Teasdale, 1978). They referred to the revision as the *hopelessness* theory of depression because (a) hopelessness is viewed as a proximal sufficient cause of the symptoms of the depressive subtype (hopelessness depression) proposed in the theory and (b) hopelessness is viewed as a final common pathway for all of the remaining causes in the theory. Thus, attributional styles and other proposed etiological variables are posited to contribute to depressive symptoms through the operation of hopelessness. Hopelessness is defined as expectations that highly desired outcomes will not occur or that highly aversive outcomes will occur, with the further expectation that nothing is going to change this situation for the better.

One purpose of our study is to test the diathesis–stress component of the hopelessness theory. According to this component the generalized tendency to attribute negative life events to stable, global causes is a vulnerability factor (attributional diathesis) that interacts with negative life events (stress) in contributing to the onset and maintenance of depressive symptoms. The theory additionally holds that this interaction takes a particular form: The attributional diathesis is associated with the onset and maintenance of depressive symptoms in the presence of negative life events but not in the absence of such events (see Metalsky, Abramson, Seligman, Semmel, & Peterson, 1982, for an early conceptualization of depression within a diathesis–stress framework). Additionally, it is hypothesized that some persons exhibit specific vulnerability. That is, depressive reactions are more likely to occur when there is a match

between the content domain of the stressor (e.g., achievement-related stressor) and the attributional diathesis (e.g., stable, global style for negative achievement outcomes) than when there is a mismatch in content domains between stressor and diathesis (see also Hammen, Marks, Mayol, & deMayo, 1985; Metalsky, Halberstadt, & Abramson, 1987).

A second purpose of the study is to test a central but, as yet, unexamined postulate of the theory: The attributional diathesis–negative life event combination (i.e., Attributional Diathesis × Stress interaction) contributes to depressive symptoms through the operation of hopelessness. This postulate is embedded within the causal mediation component of the theory, which posits that (a) the Attributional Diathesis × Stress interaction contributes to the onset of hopelessness, (b) hopelessness, in turn, culminates in subsequent depressive symptoms, and (c) the Attributional Diathesis × Stress interaction does not account for variance in depressive symptoms beyond what is accounted for by hopelessness (i.e., does not have a direct effect independent of hopelessness). In contrast, the theory allows for the possibility that hopelessness has a direct effect independent of the Attributional Diathesis × Stress interaction.

In a recent test of the diathesis–stress component of the reformulated helplessness theory (Abramson et al., 1978), Metalsky et al. (1987) examined college students' depressive mood reactions to a naturally occurring life event (i.e., outcome on a class midterm examination). They reported that students with a stable, global attributional style for negative achievement outcomes later showed a more enduring (2 days) depressive mood reaction to failure than did students with an unstable, specific style. Interestingly, whereas students' more enduring depressive mood reactions were predicted by the Attributional Diathesis × Failure interaction, their immediate mood reactions (on receipt of grades) were predicted solely by the outcome on the examination.

Whereas an increasing number of investigators have tested the diathesis–stress component of the theory (e.g., Alloy, Kayne, Romer, & Crocker, 1992; Follette & Jacobson, 1987; Johnson & Miller, 1990; Metalsky et al., 1982; Metalsky et al., 1987; Nolen-Hoeksema, Girgus, & Seligman, 1986; Robins & Block, 1989; Sacks & Bugental, 1987; see Abramson et al., 1989, for a review),

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few have tested the causal mediation component. Metalsky et al. (1987) found that students' particular attributions for failure on the midterm examination mediated the relation between their attributional styles and subsequent enduring depressive mood responses. However, Metalsky et al. (1987) did not assess hopelessness (data were collected before the formulation of the hopelessness theory) and, as a consequence, could not test postulates that go to the heart of the theory, including whether the Attributional Diathesis × Stress interaction contributes to depressive symptoms through the operation of hopelessness.

A third goal of the study was to clarify several core temporal issues (e.g., what is the time lag between hopelessness and onset of depressive symptoms? for persons with the diathesis and stressor, how long do their depressive reactions endure?). We examined these questions by assessing hopelessness and symptoms before the occurrence of the stressor (baseline) and again for 5 consecutive days after the occurrence of the stressor.

A fourth goal of the study was to test the self-esteem theories of depression. Interestingly, like the hopelessness theory, Brown and Harris (1978) argued that hopelessness is a proximal cause of depression. Moreover, they proposed that low self-esteem is a vulnerability factor that may contribute to depressive symptoms through the operation of hopelessness (see Brown & Harris, 1978, p. 265; see also Arieti & Bemporad, 1978, 1980; Becker, 1979; Jacobson, 1971). Thus, like the hopelessness theory, the self-esteem theories can be viewed as including diathesis–stress and mediation components (i.e., low self-esteem is the diathesis and hopelessness is the mediator).

A final goal of the study was to test an integration of the hopelessness and self-esteem theories. According to the integrated hypothesis, the Attributional Diathesis × Stress interaction ought to be present for persons with low self-esteem but not for persons with high self-esteem, because high self-esteem ought to serve as a buffer against depressive reactions. In this view, persons who have the attributional diathesis may be less likely to develop hopelessness when confronted with a negative life event (and therefore may be less likely to develop depressive symptoms), if they hold positive self-views rather than negative self-views (see Ickes, 1988; Ickes & Layden, 1978; Metalsky & Abramson, 1981). Thus, a positive self-view may buffer against depressive reactions by breaking the posited linkage between the attributional diathesis and hopelessness. This is quite consistent with the logic of the hopelessness theory, which explicitly posits that variables other than the attributional diathesis can also have an impact on hopelessness and the development of depressive symptoms.

Thus, according to the integrated hypothesis, depressive reactions ought to be most likely to occur among persons who exhibit the attributional diathesis, who have low self-esteem, and who are confronted with a negative life stressor (i.e., Attributional Diathesis × Low Self-Esteem × Stress Interaction). Moreover, the integrated hypothesis posits that the form of the triple interaction is, as follows: (a) The Attributional Diathesis × Stress interaction contributes to depressive symptoms among persons who are low in self-esteem but not among persons who are high in self-esteem, and (b) among those who are low in self-esteem, the attributional diathesis will contribute to depressive symptoms in the presence, but not in the absence, of negative life events.

To test the postulates of the hopelessness, self-esteem, and

integrated theories, we extended the midterm methodology developed by Metalsky et al. (1982; Metalsky et al., 1987) and examined depressive reactions to a naturally occurring event (i.e., outcome on midterm examination). In line with the diathesis–stress component of the hopelessness and self-esteem theories, we predicted that the attributional diathesis and low self-esteem each would interact with the outcomes students received on the examination to predict their subsequent depressive responses. In addition, in line with the integrated theory, we predicted that the Attributional Diathesis × Low Self-Esteem × Examination Outcome triple interaction would predict students' subsequent depressive responses. We further predicted that the form of the interactions would be consistent with that posited by the theories. Finally, we predicted that each of the interactions would predict subsequent depressive responses through the mediating role of hopelessness.

Method

Subjects and Procedure

An initial pool of 238 undergraduate students taking an abnormal psychology course at the University of Texas at Austin participated in the first session of the study. Of these students, 114 participated in the remaining sessions of the study and completed all questionnaires relevant to testing our predictions. Students received extra credit for their participation.

Some students from Session 1 did not complete the study for various reasons (e.g., they did not wish to participate, dropped the course, missed class, or participated in remaining sessions but failed to complete one or more questionnaires). As Metalsky et al. (1987) did, we excluded such subjects from all analyses. Subjects who completed the study did not differ from noncompleters on any of the Time 1 measures. Correlational analysis indicated that none of the Time 1 measures were associated with whether or not subjects completed the study. Finally, for completers, means and standard deviations on all measures were within the range typically obtained among college students (see Table 1). Thus, it is unlikely that attrition influenced the results in any significant way.

The study was conducted during the Fall 1987 and Spring 1988 semesters. The number of days between each time period was identical for the two semesters.

This investigation was part of a larger study on the psychosocial origins of depression, and thus, three pregrade baseline periods (Times 1–3) were needed in order to assess all of the proposed vulnerability factors (including several not relevant to the study we present herein), as well as baseline levels of hopelessness and symptoms. At Time 1 (September 28, 1987, and February 15, 1988), 14 days before the students received their grades, students' attributional styles, aspirations for performance on the examination, levels of hopelessness, and symptoms were assessed. Students' levels of hopelessness and symptoms were assessed again at Time 2 (October 5, 1987, and February 22, 1988), 7 days before receipt of grades; at Time 3 (October 9, 1987, and February 26, 1988), 3 days before receipt of grades; and for 5 consecutive days after they received grades, Time 4 (October 12, 1987, and February 29, 1988), the day of and immediately after receipt of grades, through Time 8 (October 16, 1987, and March 4, 1988). Self-esteem was assessed at Time 3 baseline. As in Metalsky et al.'s (1987) procedure, the pregrade assessments at Time 2 and Time 3 occurred 2 days before and 2 days after the day on which students took their examination, respectively.

Measures

For each measure, higher scores correspond to a more negative state of affairs with the exception of the self-esteem scale.

Table 1
Means and Standard Deviations for Time 1–Time 8 Measures

	EASQ		Aspiration		Exam grade		Outcome		ESEQ		EHS		BDI	
Time	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1	3.49	0.99	8.51	1.82							3.80	8.37	6.39	6.98
2											3.42	8.37	5.21	5.68
3									4.12	0.73	3.61	9.38	4.31	5.09
4					7.04	2.98	−1.47	3.11			4.27	9.99	4.82	5.26
5											3.14	8.05	4.51	6.39
6											3.61	9.22	4.17	6.15
7											3.31	8.62	3.98	5.79
8											3.32	9.19	3.83	6.10

Note. EASQ = Extended Attributional Style Questionnaire, Generality subscale for negative achievement outcomes; aspiration = grade that student considered a failure on midterm exam; exam grade = actual grade received on midterm exam; outcome = deviation between aspiration and actual exam grade; ESEQ = Extended Self-Esteem Questionnaire, Achievement subscale; EHS = Extended Hopelessness Scale; and BDI = Beck Depression Inventory.

Extended Attributional Style Questionnaire (EASQ; Metalsky et al., 1987). The EASQ consists of 12 hypothetical negative life events. As with the original Attributional Style Questionnaire (Peterson et al., 1982; Seligman, Abramson, Semmel, & von Baeyer, 1979), subjects write down the one major cause of a given event, in an open-ended format, and then rate the cause on a 1–7 scale separately for the degrees of internality, stability, and globality. Subjects also rate the importance of the event if it were to happen to them. Consistent with the concept of specific vulnerability, we used the generality subscale (mean of stability and globality) for negative achievement outcomes to test our predictions. Coefficient alpha was .80.

Extended Self-Esteem Questionnaire (ESEQ; Metalsky, 1992). We used an extended version of Rosenberg's (1965) Self-Esteem Questionnaire. Metalsky extended the scale by having subjects answer the 10 items separately for achievement-related situations, interpersonal-related situations, and situations in general. Each item is rated on a 1–5 scale. Consistent with the specific vulnerability concept as well as with the work by Hammen and colleagues (Hammen & Goodman-Brown, 1990; Hammen et al., 1985) on domain-specific negative self-schemata, we used the Achievement subscale (average across items) of the ESEQ in testing our predictions. Coefficient alpha was .92.

Outcome on midterm examination. Students' Time 1 aspiration scores ("What grade would you consider a failure on the midterm exam?"; A+ = 1 to F = 13) were subtracted from actual examination grade scores (same 13-point scale). High scores on this measure correspond to receiving a more negative outcome on the examination.[1]

Extended Hopelessness Scale (EHS; Abramson & Metalsky, 1992). In contrast to the original Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), the EHS includes 20 achievement-related items, 20 interpersonal-related items, and the 20 original items. Because we were interested in predicting generalized hopelessness, across content domains, we used all 60 items of the EHS. Standard instructions from the original scale were used (i.e., subjects completed the items for the "past week, including today"). Mean coefficient alpha across time periods was .97 (see Needles & Abramson, 1990, for sample items and validity data).

Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979). Depressive symptoms were assessed with the BDI, a 21-item self-report inventory. The BDI has yielded adequate reliability estimates, with a mean coefficient alpha of .81 in nonpsychiatric populations (Beck, Steer, & Garbin, 1988).

Results

Dummy-coded variables for semester and gender were not significant in any analysis, and therefore, data were combined

for the two semesters and across sex. These variables are not discussed further.

Descriptive data. Means and standard deviations for all measures are presented in Table 1. As can be seen there, scores fell within the range typically obtained among college students.

Overview of diathesis–stress analyses. To test our diathesis-stress predictions, we used a setwise hierarchical multiple regression procedure, analysis of partial variance (APV; Cohen & Cohen, 1983, pp. 402–422). In the present context, APV allowed us to predict residual changes in depressive symptoms from before to after students' receipt of their midterm grades (i.e., change adjusted for pregrade baseline status). In any given analysis, the dependent measure was one of the postgrade BDI scores. The pregrade BDI score was entered first into the regression equation, thereby creating the residual change scores. This, of course, also controls for pregrade baseline symptoms. Consistent with Cohen and Cohen (1983), individual variables within a given set were entered simultaneously and were not interpreted unless the set as a whole was significant. In addition, the homogeneity-of-regression assumption associated with APV was met in every case.

The results were similar regardless of whether the Time 1, Time 2, or Time 3 BDI score was used as the pregrade baseline measure, and therefore in order to conserve space, we only report on the latter results, as did Metalsky et al. (1987). It also is of interest to note in interpreting the results that the outcome on the examination was not associated with either the attributional style or self-esteem baseline measures ($rs = .03$ and $-.16$, respectively, ns). The attributional style and self-esteem baseline measures were moderately correlated ($r = -.40$, $p < .001$). In addition, the postgrade BDI scores from Times 4–8 were highly intercorrelated (mean $r = .82$; for all correlations, $ps < .001$). This ought to have had the effect of producing similar

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[1] Although Metalsky, Halberstadt, and Abramson (1987) weighted this measure by students' scores on the importance subscale for negative achievement outcomes of the Extended Attributional Style Questionnaire, Evans (1991) recently critiqued the use of such multiplicative variables. Thus, we used the unweighted measure in testing our predictions. It is of interest to note that the results were the same regardless of whether we used the weighted or unweighted outcome measure.

results at each of the postgrade time periods. Although this was the case to a large degree, the results also did vary somewhat across the postgrade time periods, as we show later.

For purposes of brevity, we refer to the Generality subscale for negative achievement outcomes as *EASQ.* Similarly, we refer to the Achievement subscale of the self-esteem measure as *ESEQ* and to the midterm examination outcome measure as *outcome.*

Diathesis–stress analyses. Predictions from the hopelessness, self-esteem, and integrated theories were tested in the following manner. For each of the postgrade BDI scores, the Time 3 BDI baseline was entered into the regression equation at Step 1; the main-effect variables (i.e., EASQ, ESEQ, and outcome) were entered at Step 2; the two-way interactions (i.e., EASQ × ESEQ, EASQ × Outcome, and ESEQ × Outcome) were entered at Step 3; and the triple interaction was entered at Step 4. Consistent with Cohen and Cohen (1983), all variables within a given set were entered simultaneously. Consequently, this approach provides a stringent test of the hopelessness theory in that it examines whether the EASQ × Outcome interaction accounts for variance in depressive reactions beyond what is accounted for by both the ESEQ × Outcome and EASQ × ESEQ interactions. Similarly, this approach provides a stringent test of the self-esteem theories in that it examines whether the ESEQ × Outcome interaction has a unique effect independent of the remaining two-way interactions. We note that although the EASQ × ESEQ interaction is not relevant to testing our predictions, its inclusion was necessary because all possible two-way interactions needed to be included in the regression equation before the three-way interaction could be tested (see Cohen & Cohen, 1983, pp. 345–348, footnote 19).

Table 2 presents the results for students' immediate depressive reactions when they received their grades (i.e., residual change in BDI scores from Time 3 to Time 4). As can be seen there, the main-effect set was significant. Analysis within the main-effect set indicated that the outcome had a significant effect independent of (i.e., after controlling for) the EASQ and ESEQ, similar to the results reported by Metalsky et al. (1987).

At odds with prediction but also consistent with Metalsky et al.'s (1987) results, none of the interactions predicted students' immediate depressive reactions (see Table 2).

The results at Time 5 were similar to the results at Times 7 and 8 (except where indicated), and therefore to conserve space and avoid redundancy, we focus on the results at Times 4, 6, and 8. As we show, the results at the latter time periods differed in some important respects from one another.

The results for students' depressive reactions at Time 6 are presented in Table 3. In contrast to the Time 4 results, the outcome measure no longer predicted students' depressive responses, whereas the EASQ did have a main effect. Moreover, in contrast to the Time 4 results, the set of two-way interactions predicted changes in BDI scores from Time 3 to Time 6. In line with the self-esteem theories, within-set analysis indicated that the ESEQ × Outcome interaction predicted changes in BDI scores from Time 3 to Time 6 beyond what was predicted by both the EASQ × Outcome and EASQ × ESEQ interactions. In line with the hopelessness theory, the EASQ × Outcome interaction also had a unique effect independent of the ESEQ × Outcome and EASQ × ESEQ interactions. The EASQ × ESEQ interaction also was significant. In addition, and in line with the integrated theory, the EASQ × ESEQ × Outcome interaction significantly predicted residual changes in BDI scores from Time 3 to Time 6.

Table 4 presents the results for students' depressive reactions at Time 8, 4 days after they received grades. As can be seen there, the two-way interaction set was significant. In contrast to the Time 6 results, and at odds with the hopelessness theory, the EASQ × Outcome interaction did not predict changes in BDI scores from Time 3 to Time 8 independent of the other two-way interactions. In contrast, and consistent with the self-esteem theories, the ESEQ × Outcome interaction had a significant effect independent of the other two-way interactions. The EASQ × ESEQ interaction also was significant. In addition, and in line with the integrated theory, the EASQ × ESEQ × Outcome interaction continued to predict depressive reactions from Time 3 to Time 8.

Table 2
Attributional Diathesis, Self-Esteem, Exam Outcome, and Interactions Predicting Residual Changes in Beck Depression Inventory (BDI) Scores from Time 3 to Time 4

Order of entry of set	Predictors	Cumulative R^2	Increment in R^2	F for increment	t for within-set predictors	df	Partial correlation
1	Time 3 BDI	.565	.565	145.32***		1, 112	.75***
2	EASQ, ESEQ, and outcome	.621	.056	5.39*		3, 109	.36*
	EASQ				0.58	109	.06
	ESEQ				−1.28	109	−.12
	Outcome				3.38**	109	.31**
3	Two-way interactions	.640	.019	1.85		3, 106	.22
	EASQ × ESEQ				−0.81	106	−.08
	EASQ × Outcome				0.59	106	.06
	ESEQ × Outcome				−1.40	106	−.13
4	EASQ × ESEQ × Outcome interaction	.649	.009	2.59		1, 105	−.15

Note. EASQ = Extended Attributional Style Questionnaire, Generality subscale for negative achievement outcomes; ESEQ = Extended Self-Esteem Questionnaire, Achievement subscale; and outcome = deviation between aspiration for performance on midterm exam and actual grade received on midterm exam.
* $p < .005.$ ** $p < .001.$ *** $p < .0001.$

Table 3

Attributional Diathesis, Self-Esteem, Exam Outcome, and Interactions Predicting Residual Changes in Beck Depression Inventory (BDI) Scores from Time 3 to Time 6

Order of entry of set	Predictors	Cumulative R^2	Increment in R^2	F for increment	t for within-set predictors	df	Partial correlation
1	Time 3 BDI	.667	.667	224.19****		1, 112	.82****
2	EASQ, ESEQ, and Outcome	.702	.035	4.28**		3, 109	.32**
	EASQ				2.14*	109	.20*
	ESEQ				−1.27	109	−.12
	Outcome				1.73	109	.16
3	Two-way interactions	.778	.076	12.03****		3, 106	.51****
	EASQ × ESEQ				−3.15***	106	−.29***
	EASQ × Outcome				2.00*	106	.19*
	ESEQ × Outcome				−2.41*	106	−.23*
4	EASQ × ESEQ × Outcome interaction	.811	.033	18.58****		1, 105	−.39****

Note. EASQ = Extended Attributional Style Questionnaire, Generality subscale for negative achievement outcomes; ESEQ = Extended Self-Esteem Questionnaire, Achievement subscale; and outcome = deviation between aspiration for performance on midterm exam and actual grade received on midterm exam.
* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .0001$.

With regard to Times 5 and 7, the results were similar to those obtained at Time 8 (see Table 4), with the exception that the EASQ × ESEQ interaction did not predict depressive responses at either of these two time periods ($prs = −.07$ and $−.14$, respectively, *ns*).

From the perspective of the integrated theory, it is important to examine whether or not the form of the triple interactions conformed to prediction. This is examined in the context of follow-up analyses to the triple interactions. In line with prediction, first-level follow-up analyses of the triple interactions involved examining the EASQ × Outcome interaction separately for low versus high self-esteem subjects (median split on ESEQ; $n = 59$ for low self-esteem subgroup, and $n = 55$ for high self-esteem subgroup). In line with prediction, the EASQ × Outcome interaction predicted residual changes in BDI scores from Time 3 to Time 6 ($pr = .45$, $p < .0005$) and from Time 3 to Time

8 ($pr = .33$, $p < .05$) among low self-esteem subjects. The corresponding partial correlations among high self-esteem subjects were −.08 and −.04, respectively (both *ns*). The same pattern of results was obtained at Times 5 and 7.

Second-level follow-up analyses of the triple interactions involved following up the significant EASQ × Outcome interactions found within the low self-esteem group (Cohen & Cohen, 1983). For these analyses, low self-esteem subjects were divided into failure versus nonfailure subgroups. The subjects were considered to be failure students if they received a midterm grade that was less than or equal to the grade they had indicated at Time 1 they would consider a failure. Nonfailure students received a grade that was greater than the grade they previously had indicated they would consider a failure ($n = 22$ for low self-esteem failure subgroup, and $n = 37$ for low self-esteem nonfailure subgroup). In line with prediction, the EASQ signifi-

Table 4

Attributional Diathesis, Self-Esteem, Exam Outcome, and Interactions Predicting Residual Changes in Beck Depression Inventory (BDI) Scores from Time 3 to Time 8

Order of entry of set	Predictors	Cumulative R^2	Increment in R^2	F for increment	t for within-set predictors	df	Partial correlation
1	Time 3 BDI	.599	.599	167.21***		1, 112	.77***
2	EASQ, ESEQ, and Outcome	.622	.023	2.18		3, 109	.24
	EASQ				0.96	109	.09
	ESEQ				−1.66	109	−.16
	Outcome				0.85	109	.08
3	Two-way interactions	.694	.072	8.30***		3, 106	.44***
	EASQ × ESEQ				−2.89**	106	−.27**
	EASQ × Outcome				1.08	106	.10
	ESEQ × Outcome				−2.23*	106	−.21*
4	EASQ × ESEQ × Outcome interaction	.737	.043	17.31***		1, 105	−.38***

Note. EASQ = Extended Attributional Style Questionnaire, Generality subscale for negative achievement outcomes; ESEQ = Extended Self-Esteem Questionnaire, Achievement subscale; and outcome = deviation between aspiration for performance on midterm exam and actual grade received on midterm exam.
* $p < .05$. ** $p < .005$. *** $p < .0001$.

cantly predicted residual changes in BDI scores from Time 3 to Time 6 ($pr = .70$, $p < .0005$) and from Time 3 to Time 8 ($pr = .52$, $p < .01$) for low self-esteem failure students but not for low self-esteem nonfailure students ($prs = .02$ and $-.01$, respectively, ns). The same pattern of results was obtained at Times 5 and 7.

To depict the triple interactions, we computed residual change scores on the BDI from Time 3 to each of the postgrade time periods within each of the following groups: low self-esteem failure ($n = 22$), low self-esteem nonfailure ($n = 37$), high self-esteem failure ($n = 19$), and high self-esteem nonfailure ($n = 36$). Each postgrade BDI score was regressed on the Time 3 BDI and EASQ within each condition. The resulting regression equations were used to calculate residual change scores for students who were one standard deviation above or below the mean on the EASQ (see Cohen & Cohen, 1983, pp. 323, 419; see also Metalsky et al., 1987).[2]

As can be seen in Figure 1, and consistent with the integrated theory, failure students with a negative attributional style did not exhibit increases in depressive symptoms if they were high in self-esteem. Similarly, failure students with low self-esteem did not exhibit increases in depressive symptoms if they had a positive attributional style. It was only when students had a combination of all three factors (negative attributional style, low self-esteem, and failure) that enduring depressive reactions ensued.

Mediation analyses. Because the two-way interactions were further qualified by a higher order interaction of all three variables, the former are best interpreted in the context of the latter. Thus, the main question of interest in our mediation analyses is whether the three-way interaction predicted depressive reactions through the mediating role of hopelessness (see Needles & Abramson, 1990, for a similar approach; see also Baron & Kenny, 1986, for a general discussion of testing mediation hypotheses).

In line with the mediation hypothesis, the EASQ × ESEQ × Outcome interaction predicted residual changes in hopelessness from Time 3 to Time 5 ($pr = .54$, $p < .0001$). In contrast, the three-way interaction did not predict residual changes in hopelessness from Time 3 to Time 4 ($pr = .09$, ns), which suggests that it takes some time for hopelessness to develop following a stressor. Also, hopelessness at Time 5, in turn, predicted residual changes in BDI scores from Time 5 to Time 6 ($pr = .35$), Time 7 ($pr = .36$), and Time 8 ($pr = .40$, all $ps < .0005$). Lastly, although the EASQ × ESEQ × Outcome interaction predicted residual changes in BDI scores from Time 3 to Times 6–8 (mean $pr = -.39$; for all partial correlations, $ps < .0001$; see Tables 3 and 4), the interaction did not predict these residual changes in BDI scores beyond hopelessness levels at Time 5 (mean $pr = -.14$; for all partial correlations, ns). In contrast, hopelessness at Time 5 did predict these residual changes in BDI scores beyond what was predicted by the three-way interaction (mean $pr = .47$; for all partial correlations, $ps < .0001$).

To further evaluate the mediation hypothesis, we examined whether depression levels at Time 5 predict changes in hopelessness from Time 5 to Times 6–8 (i.e., opposite causal direction). These analyses indicated that whereas Time 5 hopelessness predicted changes in BDI scores from Time 5 to Times 6–8 (mean $pr = .37$; for all partial correlations, $ps < .0005$; see earlier), Time 5 BDI did not predict changes in hopelessness from

Time 5 to Time 6 ($pr = .04$), Time 7 ($pr = .05$), or Time 8 ($pr = -.03$, all ns). We note that in this context the correlations among the postgrade hopelessness measures (mean $r = .89$, $ps < .0001$) were comparable with the corresponding correlations among the postgrade BDI score (mean $r = .82$, $ps < .0001$). Thus, the finding that hopelessness predicted changes in BDI scores, whereas BDI scores did not predict changes in hopelessness, was not due to differences between these two sets of correlations.

Taken together, these results suggest that the attributional diathesis–low self-esteem–failure combination predicted depressive reactions through the mediating role of hopelessness.

Discussion

The results partially corroborated postulates of the diathesis–stress component of the hopelessness and self-esteem theories. At odds with the theories but consistent with the findings reported by Metalsky et al. (1987), students' immediate (Time 4) depressive reactions were predicted solely by the outcome they received on the examination. In contrast, and consistent with prediction, attributional style interacted with failure on the examination to predict subsequent depressive reactions at Time 6. In addition, low self-esteem interacted with failure to predict subsequent depressive reactions at Times 5–8. Thus, the results appeared to provide more consistent support for the self-esteem than for the hopelessness theory. However, insofar as the two-way interactions were further qualified by the higher order three-way interaction in every case, the results may best be interpreted in the context of the integration of the hopelessness and self-esteem theories. Specifically, in line with the integrated theory, the Attributional Style × Failure interaction predicted depressive reactions at Times 5–8 for low but not for high self-esteem subjects. Additionally, descriptive analysis indicated that it was only when all three factors were present that depressive reactions ensued. In short, the results are novel in suggesting that it may be useful to incorporate the hopelessness and self-esteem theories into an integrated theory in which both attributional style and low self-esteem serve as distal diatheses that work in conjunction with one another, along with negative life events, and culminate in hopelessness and, in turn, in depressive symptoms.

In this context it is important to emphasize that this study is the first to test the integrated theory and, consequently, the results are in need of replication. In addition, we did not test important elements of the integrated theory. For example, among low self-esteem failure subjects, the attributional diathesis may lead to hopelessness through the operation of the particular attributions made for failure. Although we assessed particular attributions, similar to Metalsky et al. (1987), the sample size in the low self-esteem failure group ($n = 22$) was too small

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[2] An alternative procedure involves forming groups by further subdividing on the Extended Attributional Style Questionnaire (e.g., low self-esteem, failure, negative attributional style; low self-esteem, failure, positive attributional style; etc.) and computing residual change scores for each group. We did not take this approach because it resulted in sample sizes that were too small (e.g., $n = 9$ for high self-esteem, failure, negative attributional style students, which was the smallest cell).
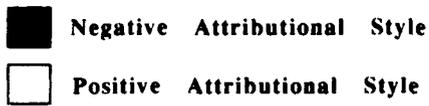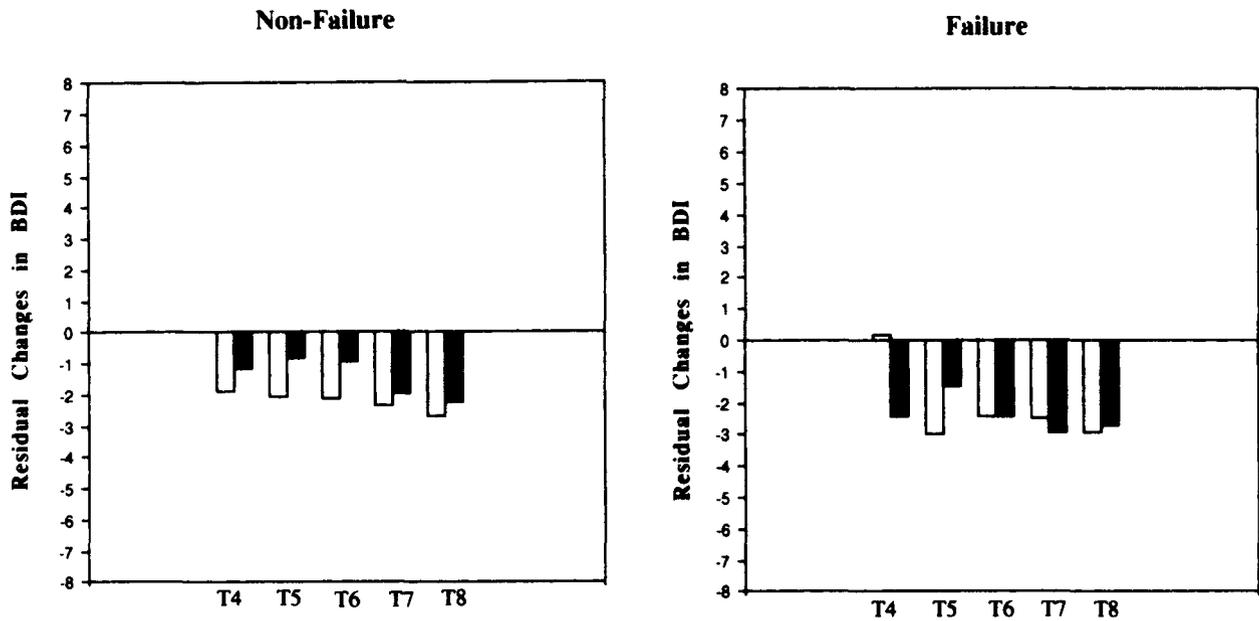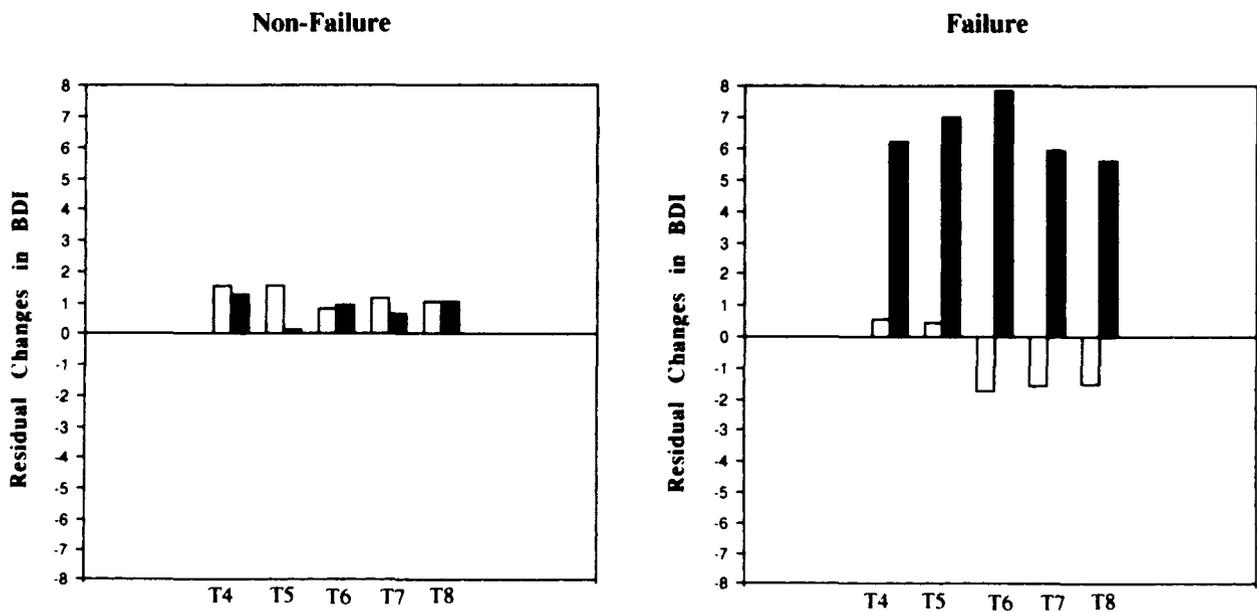
Figure 1. Residual changes in Beck Depression Inventory score from Time 3 baseline to Times 4–8 postgrade periods as a function of attributional style, self-esteem, and outcome on midterm examination.

for examining this issue. Therefore, this aspect of the integrated theory needs to be tested in future work. Additionally, insofar as our study focused on subclinical depressive symptoms, a critical question for future work is whether or not the postulates of the integrated theory apply to the onset and maintenance of the clinical syndrome of depression.

It is important to underscore that the integrated theory is not at odds with the logic of the hopelessness theory because the latter explicitly posits that factors other than the attributional diathesis also will impact on the development of hopelessness and depressive symptoms. On the other hand, the integrated theory may be viewed as extending the hopelessness theory by positing low self-esteem as an additional vulnerability factor that, in combination with the attributional diathesis and negative life events, ought to culminate in hopelessness and, in turn, in depressive symptoms. Moreover, the integrated theory further enhances the precision of the hopelessness theory by specifying when the attributional diathesis–stress combination contributes to depressive symptoms and when it does not. In fact, the results of this study suggest that the Attributional Diathesis × Stress interaction may not be obtained in a given study to the extent that the sample comprises a large proportion of subjects with high self-esteem. Thus, we suggest that investigators take into account the role of self-esteem in future tests of the hopelessness theory.

The results have a number of additional implications for past and future research. First, in this study, depressive reactions were mediated by hopelessness, in line with one of the central postulates of the hopelessness theory. To our knowledge, this represents the first test of this aspect of the theory, and therefore these results are in need of replication. Second, the initial outcome effect and subsequent diathesis–stress effect is similar to that obtained by Metalsky et al. (1987) and suggests that future researchers who use these or similar methodologies ought not to limit their poststressor assessment to the time period immediately after occurrence of the stressor (e.g., Follette & Jacobson, 1987; Metalsky et al., 1982). Third, previous investigators who have tested the diathesis–stress component of the hopelessness theory have focused on the individual attributional dimensions or the full composite of the Attributional Style Questionnaire in testing their predictions (e.g., Johnson & Miller, 1990; Robins & Block, 1989). Although relevant to evaluating the reformulated helplessness theory, the logic of the hopelessness theory suggests that it is not the individual dimensions taken in isolation but the combination of making stable, global attributions for negative life events that contribute to hopelessness and, in turn, to depressive symptoms. We therefore recommend that investigators use the Generality subscale (separately for achievement and interpersonal negative outcomes) when testing predictions of the hopelessness theory. In this context, we also suggest that investigators use one of the extended versions of the scale (e.g., Metalsky et al., 1987; Peterson & Villanova, 1988) because the original Attributional Style Questionnaire does not contain a sufficient number of achievement and interpersonal negative outcomes (i.e., three of each) to yield subscales with adequate reliability. Fourth, with regard to time lags, insofar as the attributional diathesis–low self-esteem–failure combination predicted hopelessness at Time 5, and hopelessness at Time 5 predicted depressive reactions beginning at Time 6, investigators must consider a rapid-fire model

when testing postulates of the integrated theory. With longer time lags (e.g., 6 months or more), depressive reactions may dissipate by the time they are assessed, particularly if the negative life events occur in the early part of the assessment period. These results highlight the usefulness of examining temporal parameters microscopically (e.g., day-by-day). Whether or not such a rapid-fire model is applicable to the clinical syndrome of depression is an important question for future research.

In this context, it is important to note that the similarity of the results at Times 5–8 may be due to the high correlations among the BDI scores at these time periods (mean $r = .87$). On the other hand, the similarity of the results at these time periods does not appear to be due entirely to the high intercorrelations because the results are not identical from Time 5 on (e.g., see Tables 3 and 4). Moreover, the results at Time 4 are quite different from the remaining results in spite of the fact that the BDI scores from Time 4 to Time 8 also were highly correlated with one another (mean $r = .82$).

In closing, we highlight limitations with the study and some additional implications for future research. First, we did not assess the specific constellation of symptoms hypothesized to constitute the hopelessness subtype of depression (e.g., motivational deficit and psychomotor retardation), and thus, future work needs to examine the full constellation of clinical features posited by the hopelessness theory. Second, we did not examine whether the findings are specific to depressive symptoms or whether they apply to symptoms of anxiety as well. This is an important area for future research (but see Metalsky & Joiner, in press, for findings in line with specificity to depressive versus anxious symptoms). Third, we did not examine all of the distal diatheses specified by the hopelessness theory (e.g., style to infer negative consequences), and thus, future work needs to examine these factors as well (but see Metalsky & Joiner, in press, for a recent examination of this issue). Fourth, we focused on depressive reactions to a single negative life event, and thus, a critical question for future work is whether or not the postulates of the hopelessness, self-esteem, and integrated theories apply to the development of the clinical syndrome of depression when people are confronted with major and cumulative life stressors. Similarly, we examined depressive reactions to an achievement-related stressor, and thus, future work needs to examine depressive reactions to both interpersonal-related and achievement-related stressors (i.e., specific vulnerability). Fifth, we did not attempt to determine whether hopelessness depression exists as a subtype distinct from other proposed subtypes (e.g., Klein's, 1974, endogenomorphic depression), whether it maps onto other proposed subtypes (e.g., Arieti & Bemporad's, 1980, dominant-goal depression), or whether it cuts across various nosological categories of affective or even nonaffective disorders (Abramson et al., 1989; Seligman, 1978). A major challenge awaiting future research is to determine whether or not the proposed subtype of hopelessness depression is a distinct nosological entity characterized by a specific etiology as well as by a specific program of intervention that shows differential effectiveness with respect to treatment and, ultimately, prevention.

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