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Generalization, Adverse Events, and Development of Depressive Symptoms

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ABSTRACT Many diathesis-stress models have been proposed in which cognitive processes of various types are presumed to represent vulnerabilities to development of depressive symptoms. This study tested three potential vulnerabilities as prospective predictors of such symptoms: the holding of especially high standards, the tendency to be self-critical after failure, and the tendency to generalize from a single failure to the broader sense of self-worth. At the start of a semester, college students completed a measure of these cognitive tendencies and a measure of depressive symptoms. Six weeks later they completed the same measure of depressive symptoms and a brief measure of intervening life events. Hierarchical regression analysis yielded evidence that Generalization interacted with adverse events to predict subsequent depressive symptoms. Self-Criticism also tended to predict later symptoms, but only if the symptoms were present initially. High Standards had no adverse effect.

Many theorists have suggested that cognitive variables play an important role in the development of depression. These theoretical statements have often taken the form of diathesis-stress models, in which the vulnerability leads to depressive symptoms only if the person has adverse life experiences (e.g., Abramson, Metalsky, & Alloy, 1989; Peterson & Seligman, 1984; Wise & Barnes, 1986). Some models are more focused, postulating

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that the adverse experience must occur in a particular life domain because the vulnerability is hypothesized to be specific to that domain (e.g., Blatt & Zuroff, 1992; Hammen, Ellicott, & Gitlin, 1989; Robins & Luten, 1991; Rude & Burnham, 1993; Segal, Shaw, Vella, & Katz, 1992). Even in these cases, however, the core idea is essentially the same: Given a relevant life event, a particular cognitive tendency renders the person vulnerable to the development of depressive symptoms.

Although these theories appear plausible, there has been disagreement about the extent of their empirical support. Some reviewers of this literature have concluded that the presumed cognitive vulnerabilities are really concomitants of depression rather than precursors to it (Coyne & Gotlib, 1983). That is, although hypothesized vulnerabilities usually correlate with concurrent depressive symptoms, they often fail to predict the development of symptoms prospectively. Indeed, it is not uncommon to see the cognitive tendency diminish in parallel with the depressive state.

The study reported here was intended to contribute further information on the question. I made no attempt to address all cognitive vulnerabilities that might be posed as relevant. Instead, I focused on a set of specific cognitive tendencies that I had studied previously with my collaborators (Carver & Ganellen, 1983; Carver, Ganellen, & Behar-Mitrani, 1985; Carver, La Voie, Kuhl, & Ganellen, 1988). The variables in question are the tendency to hold high standards for self-evaluation, the tendency to criticize oneself after a failure to meet a standard, and the tendency to generalize from a single failure to the broader sense of self-worth (cf. Beck, 1967).

For each of these tendencies, there is a logical basis for hypothesizing that it might contribute to the development of depressive symptoms following adverse life experiences. Having standards that are especially high (all other things being equal) makes it more likely that the person will fall short of those standards with greater frequency. If falling short of standards leads to depressed affect, the experience of adverse events (which can be thought of as creating discrepancies from standards) would lead to depressive symptoms. Thus perfectionistic goals might represent a vulnerability.

Two more issues concern what follows immediately after a failure. Some people respond to failures with a great deal of emotion, others with much less. It seems plausible that having a tendency to be self-critical in the face of failure would render a person more vulnerable to depressive

symptoms than a person who reacts less critically. The other issue concerns the extent to which the person keeps a failure encapsulated, versus letting the disappointment spill out into other realms of life. It seems plausible that a person who tends to generalize a negative emotional reaction from the specific context in which it originates to the broader sense of the self is more vulnerable than a person who tends not to do so.

Our prior research on these potential vulnerabilities began with the development of item sets to measure the tendencies, and the assessment of their associations with concurrent depression levels (Carver & Ganellen, 1983). Next these scales were tested against measures of other cognitive risk factors for depression (Carver et al., 1985). Finally, using new item sets, ones focused more explicitly on the cognitive tendencies than the original items were, we replicated these associations in new samples, including one from Germany and one from a clinical setting (Carver et al., 1988). In these studies the basic finding was this: Generalization was the only one of the three tendencies that reliably related to depression. To the extent that either of our other scales related to depression, it did so by virtue of variance it shared with generalization. A subsequent study (Ganellen, 1988) found that generalization related to depression, but not anxiety.

Those findings pertain to concurrent associations. What about the issue of vulnerability to the *development* of depressive symptoms across time? The Carver et al. (1988) article also reported three sets of panel data in which depression and cognitive styles were assessed at two points and cross-lagged correlations were examined for evidence of temporal precedence. No such evidence emerged. However, the design of those studies may have been inappropriate to test the hypothesis. The studies included no measure of stressful events during the interim. These cognitive tendencies are presumed to be diatheses. Their impact on symptoms depends, in theory, on the occurrence of stress. If there were no stress, a diathesis-stress model would predict low levels of depressive symptoms.

Kernis, Brockner, and Frankel (1989) also collected evidence bearing on this question, in the context of a study of self-esteem and reactions to failure. They found that generalization interacted with poor exam performance to yield higher levels of negative affect (mixed indicators of anger, anxiety, and depression). Indeed, generalization proved to mediate the adverse effects of poor performance on persons low in self-esteem. A limitation of the Kernis et al. study, however, is that only the tendency

to generalize was examined; thus no information was obtained regarding the other tendencies under discussion.

The study reported here was intended to remedy the design defect of our own previous studies, and to examine the three cognitive tendencies as prospective predictors of depressive symptoms in a somewhat different context. Participants reported on their cognitive tendencies and their depressive symptoms in an initial session; 6 weeks later they reported on the occurrence of several kinds of adverse events in the interim and again reported on their depressive symptoms.

METHOD

Participants were 336 undergraduates from the University of Miami (151 men, 185 women), who completed the measures described below in partial fulfillment of a course requirement. All measures were completed in group settings. The first panel of measures was collected during the first week of the semester (along with other measures not discussed here). The second panel of measures was collected 6 weeks later.

Measures

ATS-R. The measure of hypothesized cognitive vulnerabilities was the Attitudes Toward Self-Revised, or *ATS-R* (Carver et al., 1988). It includes a 3-item scale assessing High Standards (e.g., "I set higher goals for myself than other people seem to"), a 3-item scale assessing Self-Criticism (e.g., "When I don't do as well as I hoped to, I often get upset with myself"), and a 4-item scale assessing Generalization (e.g., "A single failure can change me from feeling OK to seeing only the bad in myself"). Respondents indicate the extent of their agreement with each of the items from five response options ranging from "I agree very strongly" to "I disagree very strongly." The brevity of the scales reflects the fact that the essence of each cognitive tendency is relatively straightforward, and the evidence that when simple qualities are being assessed, measures as brief as single items can convey as much information as lengthy instruments (Burisch, 1984a, 1984b).

The three scales of the *ATS-R* are factorially distinct, and several samples have demonstrated their predictive relevance for concurrent depression (see Carver et al., 1988, for psychometric detail). Alpha reliabilities in this sample were .76 for High Standards, .78 for Self-Criticism, and .78 for Generalization. In this sample women reported a stronger tendency toward Generalization ($M = 11.52$, $SD = 4.06$) than did men ($M = 10.25$, $SD = 4.08$), $F(1, 334) = 8.16$, $p < .005$, but there was no gender difference on either of the other scales.

BDI. Depressive symptoms were assessed by the short form of the Beck Depression Inventory, or BDI (Beck, Rial, & Rickels, 1974). This measure, widely used in research on depression, consists of 13 items, each measuring an aspect of depression. BDI scores were typical of student samples, with the vast majority of respondents falling into the nondepressed range. The sample mean at Time 1 was 3.08 ($SD = 3.62$), with only 10% of the students scoring 8 or higher. At Time 2 the mean was 3.77 ($SD = 3.85$), with 16% scoring 8 or higher. Women scored slightly higher than men at Time 1 ($M = 3.48$ vs. 2.57), $F(1, 334) = 5.26$, $p < .03$, and at Time 2 ($M = 4.14$ vs. 3.29), $F(1, 334) = 4.13$, $p < .05$.

Adverse events. The occurrence of adverse events in participants' lives during the intervening 6 weeks was assessed by a set of items written for this study. It was intended to be brief, to focus on experiences that are typical of student life, and to assess those experiences as domains of events rather than as a list of specific events. The first 3 items referenced adverse experiences in particular domains as follows:

1. Since the first week of classes, have you had a relatively major bad experience concerning your academics—for example, getting a bad grade on an important test or paper?
2. Since the first week of classes, have you had a relatively major bad experience with regard to a relationship—for example, breaking up with someone or having a big fight with your parents?
3. Since the first week of classes, have you had a relatively major bad experience in some aspect of your life *other than* these two?

Each of these items had four response choices: (0) “no”; (1) “yes, this has happened to me once during that period”; (2) “yes, this has happened to me twice during that period”; and (3) “yes, this has happened to me more than twice during that period.”

A final item was aimed at assessing the possibility of an accumulation of minor problems:

4. Even if you have *not* had a major bad experience in *any* aspect of your life since the first week of classes, you may have found that the start of the semester involved a certain number of minor problems or hassles. Which of the following most accurately describes your experiences during the period of time since the first week of classes?

Response options for this item ranged from (0) “no minor problems” to (4) “a very large number of minor problems and hassles.”

Examination of responses to these items revealed that 61% of the participants reported having had at least one adverse academic experience during this period ($M = .97$, $SD = .97$), 39% reported having had at least one adverse relationship

experience ($M = .59, SD = .89$), and 31% reported having had at least one other adverse experience during this period ($M = .45, SD = .79$). Reports of hassles averaged 1.44 ($SD = 1.00$), corresponding to between “a small number” and “a moderate number” of minor problems. Two gender differences emerged in these data: Women reported more relationship events than did men ($M = .70, SD = .96$ vs. $M = .43, SD = .77$), $F(1, 334) = 7.60, p < .005$, and more minor problems ($M = 1.55, SD = .97$ vs. $M = 1.30, SD = .99$), $F(1, 334) = 5.58, p < .02$.

RESULTS

Time 1 Analyses

Preliminary analyses tested correlations among the predictor scales and between those scales and Time 1 BDI scores. As is typical of the ATS-R (Carver et al., 1988), reports of having High Standards were modestly related to reports of Self-Criticism, $r = .33, p < .001$, but were relatively unrelated to Generalization ($r = .05$ n.s.). Self-Criticism was fairly strongly related to Generalization, $r = .52, p < .001$. At Time 1, Generalization and Self-Criticism were both related significantly to BDI, $r_s = .51$ and $.35$, respectively, $ps < .001$, but High Standards was not.

To assess their unique contributions to prediction, the three ATS-R scales were entered (along with gender) in a multiple regression analysis with Time 1 BDI scores as the dependent measure.¹ Interaction terms between and among the scales were also computed (after first centering the scales; see Aiken & West, 1991). The first-order interactions were entered as a group after the main effects, followed by the second-order interaction. This analysis yielded a final equation with an adjusted R-square of .29, $F(8, 327) = 17.94, p < .0001$, and four significant individual effects: Generalization related to higher BDI, $\beta = .38, p < .0001$, as did Self-Criticism, $\beta = .23, p < .0003$. High Standards was related to lower BDI, $\beta = -.11, p < .05$. The fourth effect was an interaction (unpredicted) between Self-Criticism and Generalization, $\beta = .19, p < .004$. Aiken and West (1991) recommend exploration of interactions by regressing the dependent variable onto one predictor at one SD above and one SD below the mean of the other predictor. When examined by this procedure, the interaction reflected the fact that Self-

1. Preliminary analyses also tested for interactions between gender and ATS-R scales on prediction of BDI scores. As no interaction emerged, the analyses reported here include gender as a main effect variable but disregard gender interaction terms.

Criticism was inversely related to BDI at lower levels of Generalization (which would be opposite to prediction) and was unrelated to BDI at higher levels of Generalization. I see no ready interpretation for this pattern.

Prospective Analysis

Hierarchical regression analyses were then used to predict Time 2 BDI scores. I began by summing subjects' responses across the four categories of adverse events that were reported at Time 2 (follow-up analyses examined the events separately). Time 1 BDI was entered first into the regression equation, then main effects of the summed events and the ATS-R scales, followed by first-order interactions (after appropriate centering of the contributing variables), then higher order interactions.

The final equation for the analysis using summed events yielded an adjusted R-square of .60. Time 1 BDI contributed significantly, $\beta = .48$, as did event totals, $\beta = .34$, $ps < .0001$. Generalization also contributed significantly as a main effect, $\beta = .15$, $p < .002$, and there was an interaction between Generalization and events, $\beta = .15$, $p < .006$. Examination of this interaction revealed that it took the theoretically predicted form. The regression of Time 2 BDI scores on events at one SD above the Generalization mean was substantial, $\beta = .21$, but at one SD below the Generalization mean the effect of events was negligible, $\beta = .03$.²

Further analyses examined predictions (as above) using one event class at a time (although item-total correlations averaged .66, interitem correlations across event classes were fairly low, averaging .24). Each of these analyses yielded significant main effects for Time 1 BDI, events (β s ranging from .17 to .24), and Generalization (β s ranging from .14 to .18). In three of the four cases there was also a significant interaction between event scores and Generalization. For academic events the interaction β was .10, $p < .04$; for relationship events $\beta = .13$, $p < .03$; for hassles $\beta = .14$, $p < .02$. For the analysis involving "other" major events, the interaction did not approach significance.

The sample in this study varied considerably in BDI scores at Time 1. A reasonable question to pose is whether any cognitive tendency under investigation acted differently among people who were initially somewhat

2. It is worth noting in passing that this sort of interaction is very difficult to obtain, due to multicollinearity and other problems (see McClelland & Judd, 1993).

depressed than among those who were less so. To address this question, interaction terms were created representing the interaction of Time 1 BDI with summed events, and the further interactions of these two variables with each ATS-R scale. One more analysis was then conducted in which these additional interactions were included.

This analysis yielded the same effects as had emerged previously, plus two more interactions, each significant at the .02 level. One was initial BDI by High Standards by events, the other was initial BDI by Self-Criticism by events. Exploration of these interactions by follow-up regressions was precluded by very high multicollinearity (tolerances less than .10). For descriptive purposes, however, I plotted means resulting from selection of the top and bottom quarters of each dimension. The interaction involving standards took the following form: Subjects with relatively high standards had higher Time 2 BDI as a function of higher events, whether or not they had elevated BDI at Time 1. Subjects with lower standards who had low BDI at Time 1 were unaffected by adverse events, but those with higher Time 1 BDI scores were the most adversely affected by events of all groups in the design (an effect contrary to hypothesis).

The interaction involving Self-Criticism took the following form: Events appeared to have the largest impact on Time 2 BDI among persons with the combination of high Time 1 BDI and high Self-Criticism. Events were unrelated to Time 2 BDI among persons with low initial BDI and low Self-Criticism. At low levels of one predictor and high levels of the other predictor, the effect of events was intermediate. Thus, there was at least minimal evidence that high levels of Self-Criticism can help to sustain depressive symptoms in response to problems, provided the person is already somewhat depressed beforehand.

DISCUSSION

Role of Generalization

This study provided a prospective test of three cognitive tendencies as potential vulnerabilities for development of depressive symptoms. Participants completed the measure of cognitive tendencies at Time 1, along with the BDI short form. Six weeks later they completed the BDI again, along with a brief measure of intervening negative life experiences. At the initial measurement, two of the vulnerabilities that were hypothesized—

Generalization and Self-Criticism—showed independent concurrent associations with BDI scores.

In a prospective test, controlling for BDI at Time 1, one hypothesized vulnerability—Generalization—predicted BDI scores 6 weeks later. Further, Generalization interacted with level of intervening adverse events, such that adverse events had a reliable influence on Time 2 BDI only among persons high in the tendency to generalize. This effect, though statistically significant, was not large. Although the relatively low magnitude of this effect might have been expected, given the low rate of adverse events reported, it does argue for caution in interpretation. Specifically, it remains unknown how strongly Generalization would predict the development of depressive symptoms following more severe adverse events.

A more limited tendency emerged for Self-Criticism to prospectively predict BDI scores, limited in the sense that Self-Criticism played a role only among persons who were already in some degree of distress at Time 1. Thus, Self-Criticism in combination with adverse events tended to cause existing distress to persevere, but Self-Criticism did not predict later distress among subjects who did not initially have depressive symptoms. In contrast to the findings for Generalization and Self-Criticism, the study yielded no evidence whatever that holding high standards for self-evaluation creates a vulnerability for depressive symptoms.

The findings from this study suggest that the tendency to generalize from a single failure to the broader sense of self-worth represents a prospective risk factor for depression. Certainly, the findings have limitations. Most obviously, they come from a sample of college students in which the level of depressive symptoms was generally low, rather than from a clinical sample. Another limitation is that all the variables were measured by self-report. It is possible, for example, that the reports of events were contaminated by concurrent depression, which might have produced unknown effects elsewhere in the relations among variables. A third limitation is that although the assessment devices were all face-valid and straightforward, their predictive validity with regard to outcomes other than depression per se is untested. The measure of adverse events was also somewhat arbitrary in content. Perhaps a broader inclusion of negative events (or a broader range of events *experienced*) would have revealed additional effects. Finally, events were measured retrospectively, and thus are subject to the biases inherent in retrospective assessment. Nevertheless, the findings do suggest that generalization as a

cognitive tendency is worth examining in future samples, to assess more closely its role as a vulnerability.

What Is Generalization?

Given the findings, it seems appropriate to speculate briefly on what the generalization tendency represents and how it functions. Conceptually, this tendency suggests a breakdown in the confidence of being able to maintain effective functioning in alternative aspects of life, which occurs as a function of something going wrong in one domain. This in turn suggests a kind of fragility or variability in the overall sense of self. This tendency therefore might be thought of as a vulnerability to self-esteem difficulties as well as to depression (cf. Kernis et al., 1989).

The self-esteem literature holds some disagreement about where the vulnerability in self-esteem actually is. Though low self-esteem is often viewed as the culprit (e.g., Kernis et al., 1989), several researchers in the self-esteem literature have found that labile self-esteem rather than low self-esteem predicts vulnerability to depressive symptoms after stress (Roberts & Monroe, 1992; see also Butler, Hokanson, & Flynn, 1994). Unclear from these studies, however, is what causes the lability in self-esteem and why lability creates a vulnerability. Presumably, however, lability in measured self-esteem represents fluctuations in response to events that are of low-to-moderate magnitude (Butler et al., 1994). Why this lability in response to events? One possibility that deserves further attention is that the generalization tendency is what underlies the observed lability (Kernis et al., 1989; Roberts & Monroe, 1994).

What is happening when people generalize from a bad event to the overall sense of self-worth? There are several possibilities, which are not entirely equivalent to one another. Although there are also psychoanalytic interpretations for this tendency (see Roberts & Monroe, 1994), I focus here on cognitive interpretations. One possibility is that generalizers are people who have not elaborated aspects of the self into compartmentalized units that stand relatively distinct from other aspects of the self. When a problem occurs in one domain, the distress that follows spills into other domains as well, eliciting negative thoughts and associations about those parts of life (cf. Linville, 1987).

A somewhat different possibility is suggested by a model of self-regulation that treats the self as a hierarchy of goals (Carver & Scheier, 1981, 1998). In this framework, the broad sense of the idealized

self is a very-high-order goal, whereas the concrete intentions that underlie most daily activities are lower-order goals. Whatever goal (at whatever level) is presently focal engages the hierarchy at all levels below it. Thus, for example, going grocery shopping engages a variety of planning and motoric activities that all serve the shopping goal. Trying to live up to a self-image engages a variety of decision-making and planning activities (and ultimately motoric activities) that all serve the attempt to match that self-image.

Perhaps generalizers are people who are trying to control their lives at too high a level of abstraction. Anyone working on a concrete task occasionally confronts setbacks in the effort to finish it or to perform it well. A person who is working on a task as a way of trying to maintain a sense of self-worth, however, has a bigger job when performance falters. A setback is more threatening when one's self-esteem is on the line than when the task is just a task (cf. Carver, 1996; Dweck, 1996). Thus the person trying to control behavior from too high a level will experience a setback at a lower level not as a task failure, but as a failure of the self. Given this difference in the meaning of the failure, generalizers are more vulnerable to experiencing depressive symptoms than are other people.

This latter reasoning seems plausible, but as yet it has not been tested explicitly. Doing so will be one goal for future work on this topic.

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