

## Depressive Realism and Attributional Style: Implications for Individuals at Risk for Depression

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Prior research has found that depressed individuals are more realistic in their interpretations of certain events than non-depressed individuals. However, the implications of this finding for the etiology of depressive disorders have never been clarified. The current investigation sought to remedy this situation by exploring realism in the context of a well-validated, cognitive diathesis-stress theory of the etiology of a subtype of depression: hopelessness theory (Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, 96, 358–372). A sample of 239 college students, including groups of participants with depressogenic versus nondepressogenic attributional styles, recorded the causes they assigned to events; the extent to which their attributions were objectively realistic was evaluated. A comparison of the degree of objectivity was also made between dysphoric and nondysphoric individuals. Contrary to expectations derived from the depressive realism hypothesis, dysphoric individuals exhibited less realistic attributions as compared to nondysphoric individuals. Further, individuals at risk for depression evidenced a pessimistic bias, while individuals not at risk evidenced an optimistic bias.

THE ABILITY TO OBJECTIVELY EVALUATE one's environment has figured prominently in theories of the etiology and treatment of depression. The ability to perceive an event in an unbiased manner is critical for understanding what factors

resulted in the positive or negative outcomes of said event. This understanding makes it more likely to replicate, in the future, the circumstances that bring about positive outcomes and avoid the circumstances that lead to negative outcomes, which can help to prevent symptoms of depression (Jacobson et al., 1996; Lewinsohn & MacPhillamy, 1974). Clinicians have noted anecdotally for decades that depressed individuals lack the ability to perceive an event in an unbiased manner, as their depression often colors the way that they view the world. Beck (1987) characterized depressed individuals as possessed of “depressive cognitive distortions” as opposed to the “nondepressive accuracy” of non-depressed individuals. In contrast to this clinical anecdote, there is an extensive literature on the depressive realism phenomenon (see Abramson et al., 2002, for a review) that posits exactly the opposite: that depressed persons are actually better judges of certain events in the world than their nondepressed counterparts.

### Depressive Realism Hypothesis

The “depressive realism hypothesis” (Alloy & Abramson, 1979; Alloy, Albright, Abramson, & Dykman, 1990) directly challenged conventional clinical wisdom by illustrating not only that depressed individuals can make realistic inferences, but that they do so to a greater extent than non-depressed individuals. Evidence for this phenomenon comes in the form of studies showing that depressed individuals are better able to judge experimenter-controlled contingencies between their actions and a response than nondepressed individuals (Alloy, Abramson, & Kossman, 1985; Alloy, Abramson, & Viscusi, 1981; Musson & Alloy, 1987; Vazquez, 1987). In these studies, participants are asked to press a button, which results in

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the illumination of a green light a predetermined percentage of the time. The dependent variable is the participant-rated contingency between pressing the button and the illumination of the light. In these studies, nondepressed individuals experienced an "illusion of control," in which they consistently overestimated their degree of control over the outcome. Depressed individuals experienced no such bias. Studies comparing expectancies of success on chance-determined tasks with depressed and nondepressed individuals have replicated these findings (Abramson, Garber, Edwards, & Seligman, 1978; Garber & Hollon, 1980; Golin, Terrell, & Johnson, 1977; Klein & Seligman, 1976). Similarly, studies exploring the accuracy of the self-evaluation of task performance (Gotlib, 1981; Lobitz & Post, 1979; Rozensky, Rehm, Pry, & Roth, 1977) and social interaction in the presence of an objective observer (Gibbons et al., 1985; Lewinsohn, Mischel, Chaplain, & Barton, 1980; Roth & Rehm, 1980) report findings compatible with depressive realism. In all cases, depressed individuals were better able to judge their performance (either prospectively or retrospectively) than nondepressed individuals.

Despite the apparent wealth of findings in support of depressive realism, numerous studies have not presented favorable results. Studies assessing the accuracy of depressed and nondepressed persons' delayed recall of both task performance (Craighead, Hickey, & DeMonbreun, 1979; DeMonbreun & Craighead, 1977) and ambiguous personality feedback (Dykman, Abramson, Alloy, & Hartlage, 1989; Gotlib, 1983; Vestre & Caulfield, 1986) have returned results largely showing both groups to be equally accurate. The literature examining the accuracy of recall of task performance feedback has returned consistently similar results for ambiguous feedback (Craighead et al., 1979; DeMonbreun & Craighead, 1977). Depressed individuals tended to underestimate positive feedback, and nondepressed individuals tended to overestimate it (Buchwald, 1977; Wener & Rehm, 1975), illustrating bias among both groups. An additional critique of the depressive realism literature comes from Ackerman and DeRubeis (1991), who perceptively note that the aforementioned research on expectancies of success cannot be said to unequivocally support depressive realism, as no objective standard of reality exists for an expectation. They give the example of a plausible rival hypothesis in a nondepressed individual who may overestimate his or her chance of success with the expectation that practice will improve future performance.

The current investigation, described below, attempts to address this latter concern with the

use of objectively rated materials while placing the approach within the context of a contemporary theory of depression, the hopelessness theory (Abramson, Metalsky, & Alloy, 1989). Objective ratings were both pooled across three extensively trained raters and were collected before the current investigation was conceived, limiting the potential for systematic bias.

Before it is possible to understand how research on the etiology of depression can be informed by the depressive realism literature, it is necessary to understand theory on the etiology of depression. First, the theory of the etiology of depression (as described by Beck, 1967, 1987), which both predicts antidepressive realism effects and serves as the basis for much of the treatment of depression, will be reviewed. Next, hopelessness theory, a more contemporary theory that is agnostic on the issue of depressive realism and serves as the model of the etiology of depression in the current investigation, will be discussed.

### Beck's Theory

Beck (1967, 1987) posits that depressed affect is heavily influenced by recurrent thoughts with negative content or automatic thoughts. These thoughts arise from deeply held dysfunctional beliefs or schemas. Beck asserted that schemas and automatic thoughts, and the depressed affect that results from them, tend to be self-perpetuating. Depressed persons are thought to both attend more to negative events in their lives and interpret events that occur after the onset of the depressed mood in light of their own dysfunctional cognitions. Beck (1987) characterizes the cognition of depressed individuals as "schema-driven," in contrast to the cognition of nondepressed individuals, which he describes as "data-driven," implying that depressed individuals' cognitions are systematically less informed by reality and, hence, more irrational. For instance, a depressed person may experience a significant success (such as getting a good grade on a test) while in a depressed state but may minimize the importance of that event as due to chance because "I'm a failure, how can I do anything right?" Despite this significant role in both Beck's theory and in cognitive therapy, however, realism remains empirically uninvestigated both in the context of this theory, as well as in other cognitive theories of the etiology of depression.

### Hopelessness Theory

The hopelessness theory of depression (Abramson et al., 1989) is another theory that has received

considerable empirical support. Hopelessness theory follows from the reformulated learned helplessness theory (Abramson, Seligman, & Teasdale, 1978) of depression. Both of these two theories emphasize a cognitive vulnerability to depression that is based on the way that individuals assign causes to events in their lives. In the reformulated learned helplessness theory, the tendency to view negative events as due to internal ("It's all my fault"), stable ("The cause will exist to effect my life forever"), and global ("The cause influences all aspects of my life") causes is thought to increase an individual's likelihood to develop depression when confronted with negative life events. In hopelessness theory, this cognitive vulnerability factor is retained, but the internality dimension is deemphasized in favor of the stability and globality dimensions.

The strongest evidence in favor of hopelessness theory comes from the Cognitive Vulnerability to Depression Project (Abramson et al., 1999; Alloy et al., 1999, 2000), which utilized both a retrospective and prospective behavioral high-risk design at two different sites to directly test it. In this study, entire classes of college students were screened for their degree of cognitive vulnerability to depression. Currently nondepressed individuals were identified as either "high-risk" or "low-risk" based on the degree to which they endorsed a depressogenic cognitive style as well as dysfunctional beliefs (Beck, 1967; 1987). They were then followed every 6 weeks for 2 ½ years and then followed every 4 months for an additional 3 years. Both the retrospective (Alloy et al., 2000) and the prospective (Abramson et al., 1999; Alloy et al., 1999) portions of this design found higher rates of depression in the high-risk group as compared to the low-risk group.

Although hopelessness theory is silent on the issue of how objective or realistic these attributions are (Abramson et al., 2002), the depressive realism literature has attempted to address this question. However, this degree of objectivity does not figure into the etiology of depression as defined by hopelessness theory, and the relationship between attributional style and realism remains unclear. These seemingly contradictory theories of how the depressed client should be viewed, as either more biased (according to Beck's widely accepted theory and much clinical lore) or less biased in her or his perceptions (according to the literature in favor of depressive realism), represents a paradox that has yet to be successfully resolved. The picture is further muddled by inconsistent results and methodological critique of the depressive realism literature.

It is currently unknown to what extent being at risk for depression may be associated with an

inability to realistically perceive the world. It is possible that being unable to objectively perceive events may lead one to make attributions that are both more likely to lead to depression and less informed by reality. For instance, individuals may see negative events as their fault even when they had nothing to do with these events. In turn, this attribution may make one more likely to become depressed. The current investigation intends to inform the theoretical conceptualization of depression through the exploration of depressive realism in individuals both at risk for the disorder and individuals suffering from symptoms of depression. On a measure of how closely their perceptions of events mirror reality, individuals thought to be at risk for depression were compared to individuals not at risk, and individuals reporting symptoms of depression were compared to individuals not reporting such symptoms. Specifically, the degree to which their perceptions of the causes of hypothetical events matched reality was compared across groups using a novel method of assessment. It is hoped that by investigating the role that realism plays in the causes of depression that some of the prior ambiguity in the literature as to how to characterize the thought processes of those who are depressed will be resolved.

#### HYPOTHESES

We hypothesized that:

1. Individuals with a depressogenic attributional style would be more realistic in how they assign causes to events than those with a nondepressogenic attributional style.
2. Similar to preexisting findings in the depressive realism literature, dysphoric individuals would be more realistic than their nondysphoric cohorts.

#### Method

##### PARTICIPANTS

Data were obtained from 239 undergraduate students enrolled in Introductory Psychology at a large university in the midwestern United States and who participated in exchange for course credit. Of these students, 136 (56.9%) were female, and 103 (43.1%) were male. The mean age was 19.49 years ( $SD = 3.5$ ). The sample consisted of 202 Caucasian participants (84.5%), 25 African-American participants (10.5%), 2 Asian-American participants (0.8%), 2 Hispanic participants (0.8%), 5 participants who classified themselves as "other" (2.1%), and 3 participants who did not report their race (1.3%).

## MEASURES

The Attributional Style Questionnaire (ASQ; Peterson et al., 1982; Seligman, Abramson, Semmel, & von Baeyer, 1979) is a self-report inventory that assesses causal attributions for six hypothetical positive and six hypothetical negative events along the dimensions of stability and globality that are rated on a 1 to 7 scale (internality is also assessed but is not considered further here). Higher ratings represent more depressogenic responses and more stable and global causes while lower ratings represent more unstable and specific causes. A generality score is then computed by averaging the values of the 12 stability and globality items across negative events to produce a score that ranges from 1 to 7. The internal consistency of generality for the current sample was good (Cronbach's  $\alpha = .86$ ).

The Beck Depression Inventory–Second Edition (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report instrument that broadly assesses the symptoms of depression including the affective, cognitive, behavioral, somatic, and motivational components as well as suicidal wishes. Beck et al. (1996) reported a high internal consistency in a university population ( $\alpha = .93$ ), which is equivalent to the internal consistency in the current study ( $\alpha = .93$ ). They also found the BDI-II to possess adequate test-retest reliability and convergent validity with other measures of symptoms of depression.

The Content Analysis of Verbatim Explanations (CAVE; Peterson, Schulman, Castellon, & Seligman, 1992) is a procedure by which statements describing an actual event and its cause can be extracted from everyday speech and then independently rated on the dimensions of stability and globality (similar to the ASQ) by trained raters. For the current study, preextracted and prerated cause-event statements were provided to participants, who were then asked to rate them without knowledge of the prior, independent ratings. Participants, therefore, made ratings on the same cause-event statements as the trained raters. Participants were presented with 6 positive events and 6 negative events (12 total events) and a generality score was computed by averaging the stable and global items for negative events, similar to that used with the ASQ. The cause-event statements were presented to the participants under two different sets of instructions. Under one set of instructions participants were asked to rate the causes as if the event had happened to them (CAVE-Self) as well as if it had happened “to most other people” (CAVE-Other). Thus, participants provided ratings for 24 events (the 12 cause-event statements for the CAVE-

Self were different than the 12 CAVE-Other materials). The causes were selected to represent a broad array of differing attributional styles, with depressogenic causes, neutral causes, and nondepressogenic causes being selected. The events were also sampled broadly and represented equal numbers of two general content areas: events dealing with interpersonal matters (“I broke up with my boyfriend/girlfriend”) and achievement-related matters (“I succeeded on a math test”). The levels of independently-rated attributional style and content area for all ratings were counterbalanced and equivalent across both the CAVE-Self and CAVE-Other forms.

The event-attribution statements were obtained from a daily diary study of attributional style conducted by the second author that asked participants to record the best and worst events of the day and the cause of those events (Fresco, Moore, Walt, & Craighead, 2006). It should be noted that the statements refer to objectively real events, and the actual attributions to those events, that were generated by individuals similar to the current study participants (i.e., in age, level of education, race). The use of experimenter-provided event-attribution statements was necessary to ensure that an objective reality existed that could be judged. By providing statements with which the individual has no prior history, the likelihood that the participant is responding to the statement itself, and not to memories of events closely associated to the cause or the event, is increased. Therefore, we see the use of experimenter-provided assessment materials as necessary to the internal validity of the study. CAVE raters were trained by the second author by first having them read Peterson's CAVE scoring manual (Peterson et al., 1992) and practicing 100 hypothetical event-attribution statements. Interrater agreement was also calculated for 3 raters, from a random sample of 86 extractions, which was taken from a pool of over 6000 extractions collected as part of the aforementioned daily diary study. The extractions used in the current study were drawn from this pool and rated by the same 3 raters. An acceptable degree of interrater agreement was obtained ( $\alpha = .82$ , intraclass correlation =  $.82$ ), as predicted. This finding is particularly significant as a high degree of interrater agreement lends credibility to the claim that our raters were objectively rating and limit the plausibility that rater bias may have accounted for the obtained results.

In the current investigation, the participants' subjectively, self-rated CAVE materials for negative events (CAVE-Self) were compared to the objective ratings for negative events obtained previously by



computing a difference score in which the CAVE-Self ratings were subtracted from the objective ratings. In this manner a score of zero indicates perfect objectivity, increasingly positive scores (up to a maximum score of +7) indicate an optimistic (nondepressogenic) bias, and increasingly negative scores (up to a maximum of -6) indicate pessimistic (depressogenic) bias. A difference score was also similarly computed for the CAVE-Self and CAVE-Other ratings, in which the former was subtracted from the latter, with the hypothesis that those who are more objective in assigning causes to events will recognize that this characteristic differentiates themselves from others. Previous research involving these types of self-other differences in the realm of social comparison have consistently found that nondepressed individuals exhibit a self-enhancing bias, whereas depressed individuals are relatively objective (Ahrens, Zeiss, & Kanfer, 1988; Alloy & Ahrens, 1987; Crocker, Alloy, & Kayne, 1988; Siegel & Alloy, 1990). Similar to the realism score above, increasingly positive scores indicate optimistic bias whereas increasingly negative scores indicate pessimistic bias.

Although the psychometric properties of the CAVE as traditionally performed do not apply directly to the difference score, they do apply to the independent CAVE ratings and illustrate that CAVE raters can objectively and accurately rate the attributional style present in extracted speech, and so will be outlined below. In addition, although the use of the difference score technique is novel: (a) the use of CAVE ratings to realistically evaluate attributional style (in the CAVE-Objective ratings) and (b) the use of participant ratings of cause and event statements to assess attributional style (see the CAVE-Self and ASQ) are not novel and are quite well established. Therefore, although the difference score has not been the subject of psychometric evaluation, its two component parts (the CAVE-Self and objective CAVE ratings) have undergone extensive tests of their construct validity, adding to the confidence that can be placed in results utilizing them.

The CAVE has been shown to have adequate internal consistency for both the stability ( $\alpha = .59$ ) and globality ( $\alpha = .62$ ) dimensions separately, as well as the composite of the negative event scores ( $\alpha = .85$ ; Abela, Fresco, Kostelnik, & Payne, 2003). It has also been shown to possess adequate retest reliability for both the stability and globality dimensions ( $r = .63 - .90$ ; Peterson, Bettes, & Seligman, 1985; Schulman, Castellon, & Seligman, 1989). In the current study, generality computed from both the CAVE-Self and CAVE-Other rated materials had internal consistencies similar to that

found previously ( $\alpha = .83$  and  $\alpha = .80$ , respectively). The CAVE also demonstrates adequate concurrent validity as it was found to correlate significantly (between  $r = .48$  and  $.52$ ) with the ASQ composite of negative event dimensions (internality, stability, and globality; Abela et al., 2003; Peterson et al., 1985; Schulman et al., 1989). In addition, CAVE attributional style was found to correlate between  $r = .23 - .36$  with the BDI (Abela et al., 2003; Schulman et al., 1989). In the current investigation the CAVE ratings correlated significantly with the ASQ ratings for negative events,  $r(236) = .63$ ,  $p < .001$ , and BDI total scores,  $r(238) = .37$ ,  $p < .001$ . In addition, the correlations between the CAVE and the BDI and the CAVE and the ASQ,  $r(235) = .42$ ,  $p < .001$ , did not differ significantly from one another,  $t(232) = 10.4$  *ns*. CAVE ratings were found to have significantly higher agreement than chance with a structured diagnostic interview and to be able to discriminate between participants with generalized anxiety disorder and depression (Riskind, Castellon, & Beck, 1989), illustrating both criterion and discriminant validity, respectively.

#### PROCEDURE

All participants were first screened with the ASQ and contacted by telephone to invite them to participate in the study if they possessed either a depressogenic or nondepressogenic attributional style. Participants were assigned to attributional style groups (depressogenic or nondepressogenic) if the average of their stability and globality scores for negative events (generality) either exceeded 4.5 (composing the depressogenic group) or was lower than or equal to 3.5 (composing the nondepressogenic group). Prior research has established the use of upper and lower quartiles as a valid methodology for identifying individuals at risk and not at risk for depression (Abramson et al., 1999; Alloy et al., 1999, 2000). In addition, prior research utilizing a similar sample (Fresco, Moore, Ostrowski, & Arney, 2003) identified an ASQ score of 3.96 as the mean and 4.5 as the cutoff for the uppermost quartile, which was just under one standard deviation ( $SD = 0.63$ ) above the mean. These values were comparable to what was found in the current investigation, as the mean ASQ generality score of the entire screening sample ( $N = 1745$ ) was 3.97 ( $SD = 0.85$ ). The sample that was used in the study by Fresco et al. (2003) was similar to the current sample in that both were obtained at the same midwestern university, at roughly the same time (within 6 months of each other), and in very similar contexts (the university mass testing procedure, which is held in the same location every

year). The screening sample used in the current investigation was not used to establish recommended cutoffs for high and low scores on the ASQ as participants were screened and data collected on two occasions. Therefore, information on the complete screening sample would not be available until after data screened from the first occasion were collected.

Participants in both the depressogenic and nondepressogenic groups were then randomly assigned to one of two conditions based on presentation order of the assessment materials. The subset of participants identified as eligible and who decided to participate first gave informed consent and then completed all the measures listed above, the order of which was counterbalanced. All research assistants interacting with the participants were blind to their attributional style and all research hypotheses. Interactions with participants both during telephone solicitation and completing questionnaires were scripted, copies of which are available from the authors upon request.

## Results

Comparison of eligible mass testing participants who decided to participate ( $N = 239$ ) with eligible individuals who did not participate ( $N = 60$ ) revealed that the two groups did not differ in regards to attributional style [ $F(1, 296) = 0.75, p = .39$ , Cohen's  $f = .05$ ], age [ $F(1, 294) = 1.91, p = .17, f = .08$ ], race [ $\chi^2(4, N = 296) = 1.53, p = .82$ ], mother's level of education [ $\chi^2(8, N = 297) = 14.42, p = .07$ ], and father's level of education [ $\chi^2(9, N = 296) = 5.42, p = .80$ ]. However, the two groups did differ in gender ratio [ $\chi^2(1, N = 299) = 5.40, p = .02$ ], with a greater female-to-male ratio in the nonparticipants (44:16 = 2.75) than in the participants (136:103 = 1.32), implying that females were more likely to decline participation than males. However, given the overall high rate at which participants decided to participate (79.9%), this differential rate does not seriously jeopardize the generalizability of the findings to other, similar student samples.

In addition, examination of differences between the demographic (gender, income, age, race, mother's and father's level of education) and primary study variables (see Methods above) among the order of completion of the CAVE questionnaires (Self-first versus Other-first) revealed no significant differences between those participants completing the CAVE-Other form first and those completing the CAVE-Self form first when a Bonferroni correction was utilized to control inflation of Type I Error (adjusted  $\alpha = .05/14 = .0036$ ).

As mentioned previously, participants were stratified on attributional style according to the cutoffs for the upper and lower quartiles of the screening sample, in which individuals with ASQ Generality scores at or above 4.5 were labeled as possessing a depressogenic attributional style and those with ASQ Generality scores at or below 3.5 were labeled as possessing a nondepressogenic attributional style. Participants were also stratified according to their BDI-II scores; participants with scores of 14 or above were labeled as dysphoric, and participants with scores of 13 or below as nondysphoric, according to research illustrating that these cutoffs maximize both sensitivity and specificity (Beck et al., 1996). Examination of the demographic variables mentioned above (gender, income, age, race, mother's and father's level of education) with attributional style and dysphoria used as grouping variables also revealed no significant differences.

Hypotheses 1 and 2 sought to explore the relationship between attributional style, dysphoria, and realism. In service of this goal, a multivariate analysis of variance (MANOVA) was conducted using attributional style and dysphoria as the independent variables, and realism of attributional style (the objective CAVE ratings–CAVE-Self difference score) and the CAVE-Self–CAVE-Other difference score as the dependent variables. This omnibus multivariate test was run first and significant results decomposed using univariate tests (see below) to reduce Type I Error rates, which would be artificially inflated through the use of multiple univariate tests. Significant multivariate differences were found for attributional style [Wilks's  $\lambda = .728, F(2, 191) = 35.76, p < .001$ , Cohen's  $f = .61$ ] and dysphoria [Wilks's  $\lambda = .960, F(2, 191) = 4.02, p = .02, f = .20$ ]. The former exceeded Cohen's (1988) conventions for a large effect, and the latter approached a medium effect. Insofar as there was no significant multivariate effect for the Attributional Style  $\times$  Dysphoria interaction [Wilks's  $\lambda = .989, F(2, 191) = 1.07, ns, f = .10$ ], which corresponded to less than a small effect, it was not decomposed using univariate tests and will not be described further. Examination of specific hypothesis follows.

Hypothesis 1 posited that individuals with a depressogenic attributional style would be more realistic than their nondepressogenic peers. This hypothesis was examined using univariate follow-up tests to the MANOVA above (see Table 1 for means and standard deviations listed as a function of group). Using the Bonferroni method to correct for inflation of Type I Error rates, the results for each dependent variable (realism and the self-other

Table 1  
Sample means for the realism and self–other difference as a function of attributional style and dysphoric and nondysphoric groups

|            | Depressogenic attributional style<br>group mean (SD) | Nondepressogenic attributional style<br>group mean (SD) | Dysphoric group<br>mean (SD) | Nondysphoric<br>group mean (SD) |
|------------|--|---|------------------------------|---------------------------------|
| Realism    | -0.67<br>(0.75)                                      | 0.37***<br>(0.93)                                       | -0.45<br>(0.88)              | 0.04*<br>(0.94)                 |
| Self-Other | -0.14<br>(0.61)                                      | -0.01<br>(0.96)   | -0.27<br>(0.88)              | 0.02**<br>(0.78)                |

Note. Realism=objective CAVE ratings – subjective CAVE ratings difference score; Self-Other = CAVE-Other – CAVE-Self difference score; \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

difference score) were tested at the  $p < .025$  level ( $.05/2 = .025$ ). The result for realism,  $F(1, 196) = 44.38$ ,  $p < .001$ ,  $f = .48$ , was significant and exceeded the convention for a large effect. However, counter to expectations, the group possessed of a depressogenic attributional style was *less* realistic than the nondepressogenic group. The result for the self-other difference score,  $F(1, 196) = .02$ ,  $ns$ ,  $f = .00$ , was nonsignificant and corresponded to a small effect.

As the index of realism constructed for the current study represents a difference score between ratings made by study participants and ratings made by objective raters, scores approaching zero represent greater objectivity. Thus, two one-sample  $t$ -tests were used to determine if the realism scores for the depressogenic and nondepressogenic groups differed significantly from zero, to test not only if one group was more or less objective in a relative sense, but also in a less comparative manner. Realism scores of those with a nondepressogenic attributional style differed significantly from zero in a positive direction,  $t(110) = 4.16$ ,  $p < .001$ ,  $d = 0.79$ , which is indicative of optimistic bias and corresponded to a large effect. The depressogenic group's realism scores also differed significantly from zero but did so in a pessimistic direction,  $t(85) = -8.37$ ,  $p < .001$ ,  $d = -1.82$ , a finding that exceeded conventions for a large effect. These results, counter to expectations, suggest bias among both individuals with a depressogenic, as well as a nondepressogenic attributional style, although of different magnitudes and opposite valence.

Hypothesis 2 posited that dysphoric individuals would be more realistic than their nondysphoric cohorts. Similar to Hypothesis 1, this hypothesis was evaluated using univariate follow-up tests, utilizing the dysphoria grouping variable as the independent variable, to the multivariate main effect of dysphoria mentioned above (see Table 1 for means and standard deviations listed as a function of group). Using the Bonferroni method to correct for inflation of Type I Error rates, the results for each dependent variable (realism and the self-other difference score) were again tested at the  $p \leq .025$

level ( $.05/2 = .025$ ). Unlike the results stratifying participants based upon attributional style, there were significant results for both realism,  $F(1, 196) = 5.75$ ,  $p < .02$ ,  $f = .17$ , and the self-other difference score,  $F(1, 196) = 7.12$ ,  $p < .01$ ,  $f = .19$ , which only corresponded to small-to-medium effects. However, similar to the findings for attributional style and counter to expectations, dysphoric individuals evidenced *less* realism (scores more different from zero) than nondysphoric individuals. Inspection of the group means indicates that nondysphoric individuals illustrated a more realistic attributional style and an attributional style that was less discrepant from most other people, while dysphoric individuals reported that their attributional style was more pessimistic than most others. Similar to the analyses for the attributional style grouping variable, two one-sample  $t$ -tests were conducted. Realism scores among nondysphoric participants did not differ significantly from zero,  $t(162) = 0.59$ ,  $ns$ , Cohen's  $d = .09$ , whereas realism scores among dysphoric participants differed significantly from zero,  $t(74) = -4.51$ ,  $p < .001$ ,  $d = -1.05$ , and indicated a large, pessimistic bias. Although both participants with a depressogenic attributional style and participants with a nondepressogenic attributional style seem to be biased in their causal attributions, this was not the case among dysphoric and nondysphoric individuals, as only dysphoric individuals seem to evidence this bias.

## Discussion

The aims of the present study were to determine the relationships between attributional style, dysphoria, and the degree of objectivity or realism that individuals possess regarding how they attribute causes to events in their lives. Strengths of the current study involve addressing past critiques regarding the assessment of realism without an objective standard of reality (Ackerman & DeRubeis, 1991) and the integration of theory on depressive realism with preexisting theory on the etiology of depression.

Contrary to the depressive realism hypothesis and our expectations for this study, participants

possessing a depressogenic attributional style, as well as dysphoric individuals irrespective of their attributional style, were found to be less objective in their assessment of the causes of events in their lives. Individuals with a depressogenic attributional style were found to be pessimistically biased, whereas individuals with a nondepressogenic attributional style were found to be optimistically biased. In addition, dysphoric individuals were found to be biased pessimistically whereas nondysphoric individuals were found to be relatively realistic in their attributions of events. Taken together, these results indicate that the significance of the role of attributional style in the depressive realism phenomenon more generally, as compared to depressive symptoms, may be in need of reevaluation and further exploration.

The current investigation may have practical applications to the treatment of depression. Insofar as Beck (1987) characterizes depressed persons as lacking in the ability to objectively evaluate their environment, one of the primary goals of cognitive therapy of depression (Beck, Rush, Shaw, & Emery, 1979) is to teach depressed individuals to analytically monitor their own negative thoughts, independent of their current mood state, in such a way that they can identify and challenge the source of these thoughts. However, despite being one of the most empirically supported treatments in the history of psychotherapy (Blackburn & Moorhead, 2001; DeRubeis & Crits-Cristoph, 1998) and one of the most efficacious treatments for depression (DeRubeis & Crits-Cristoph, 1998), it lacks a strong research base into the role increased realism may play in the success of treatment. Future study will involve using the novel method of assessing realism introduced here and evaluating if this tendency does indeed reliably covary with the alleviation of depressive symptoms in therapy, as predicted by Beck and his colleagues (1979). In addition, the current study provides preliminary evidence that people can differ in the degree to which their perceptions of events correspond to an objective measure of reality. The inability of certain individuals to realistically perceive the causes of events may help to explain the maintenance of mood disorders and their increasingly chronic and recurrent course in individuals lacking significant life stressors.

The findings of the current investigation need to be interpreted in light of certain limitations in both external and internal validity. Insofar as the stimuli used for the CAVE materials were preexisting and not internally generated by the participants themselves, the lack of personal relevance of these events differs systematically from events outside of the

laboratory that have been shown to predict depressive symptoms (Abramson et al., 1999; Alloy et al., 1999, 2000). Therefore, it is uncertain to what extent the relationship found between depression and realism of attributional style found in the current investigation would generalize to individuals outside of the lab. In addition, the current sample was a sample of convenience composed of relatively young college students, and the ability of results obtained with this sample to generalize to the broader population of people suffering from depressive symptoms is uncertain at best.

The external validity of the construct of depression as assessed here is also called into question. Research has posited that mood and cognition are related to one another through cognitive-associative networks where depressive affect primes the occurrence of depression-related cognitions, and visa-versa. This interplay of affect and cognition is thought to most validly represent the etiology and maintenance of various disorders of mood (Ingram, 1984; Teasdale, 1988). Related research has shown that cognitions primed by dysphoric affect are more predictive of the future occurrence of depressive symptoms than those that are unprimed. This effect holds whether the negative affect is caused by false, negative feedback on an IQ test (Abela & Brozina, 2004) or vivid recall of past negative events (Abela, Brozina, & Seligman, 2004). Therefore, the fact that a negative mood prime was not used in the assessment of depression-related cognition in the current investigation calls into question the validity of the results for depression as it may occur outside the laboratory. In addition, the primary use of self-report as an assessment strategy is a further limitation. Without the use of more diverse assessment strategies, the influence of common method variance on the results obtained is unknown and serves as a plausible rival hypothesis.

Future research in the area of realism in attributional style should both address the aforementioned limitations and attempt to resolve the current inconsistency of findings in the literature on depressive realism, as well as investigate the processes that may give rise to the depressive realism effect. An examination of the research in depressive realism has found that the divergence of findings varies consistently with the ecological validity of the stimulus materials used, with more ecologically valid stimulus materials being less supportive of depressive realism (Dobson & Franche, 1989). Therefore, it remains possible that the divergence of the findings of the current study from past research involving judgments of contingency, in which a depressive realism effect was found, is due to the more ecologically valid



methods used in the current investigation. However, this explanation for the schism in the literature has not yet been empirically validated. For instance, it is equally plausible that there are fundamental differences in cognitive process that occur between causal attributions and judgments of contingency that account for the divergent findings, irrespective of the research methods used.

A wealth of research findings have demonstrated the effects of information processing biases in depression that may shed light on the question of these potential differences in cognitive processes. Gotlib, McCabe, and their colleagues have studied the role of attention and found that nondepressed individuals reliably evidence either a bias toward stimuli likely to result in a positive mood or away from stimuli likely to result in a negative mood and that depressed individuals show no such bias (Gotlib, McLachlan, & Katz, 1988; McCabe & Gotlib, 1995). They also found that this effect holds both when assessed with a mood prime (McCabe, Gotlib, & Martin, 2000) and under a variety of stimulus presentation intervals (McCabe & Toman, 2000). However, research into self-focused attention and autobiographical memory (Goddard, Dritschel, & Burton, 1996; Kuyken & Brewin, 1995; Kuyken & Dalgleish, 1995; Puffet, Jehin-Marchot, Timsit-Berthier, & Timsit, 1991), as well as memory recall research in general (Bradley & Matthews, 1983; Derry & Kuiper, 1981; Gilboa & Gotlib, 1997; MacLeod, Mathews, & Tata, 1986), finds that depressed individuals show a preference for negatively valenced, self-referent information and that this bias reliably predicts the occurrence of depressive symptoms. Perhaps a processing deficit occurring after attention/encoding accounts for the bias found in the depressed person's memory and the pessimistic bias found in the current investigation. Such an explanation would account for why studies of attention are supportive, and studies of information processing thought to occur after encoding (i.e. memory retrieval) are not supportive, of a depressive realism effect. Future research specifically assessing depressive realism at encoding, and then several weeks later at retrieval, could resolve this ambiguity.

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