2006

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Publication Details
Behavior Therapy

Available online at www.sciencedirect.com
ScienceDirect
Behavior Therapy 37 (2006) 259–268
Behavior Therapy
www.elsevier.com/locate/bt

Am I Blue? Depressed Mood and the Consequences of Self-Focus for the Interpretation and Recall of Ambiguous Words

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In two experiments, dysphoric and nondysphoric students first concentrated on either self-focused or other-focused phrases and then performed an ostensibly unrelated task involving the interpretation of homographs with both personal and impersonal meanings. In Experiment 1, they constructed sentences for the homographs; dysphoric students' sentences were more emotionally negative (although not more personal) in the self-focused condition than in the other-focused condition. In Experiment 2, they freely associated to the homographs, and the percentage of personal meanings reflected by the associations revealed an effect of self versus other focus that depended on mood group. Following free associations, they attempted to recall the homographs. Dysphoric students (but not nondysphoric students) recalled a greater percentage of personally interpreted homographs if they had focused on self than if they had focused on other matters. In general, these results suggest that ruminative or self-focused thinking by people in depressed moods transfers to novel ambiguous situations, encouraging more negative interpretations and better recall of personal interpretations.

AMBIGUOUS MEANING in everyday situations surely is often not recognized as such. Cognitive habits, established by recent or frequent experience, save us from conscious decisions about meaning. Along emotional dimensions, habits of positive thinking may cause us to respond optimistically, whereas negative habits may cause us to be more skeptical. And for many people in depressed or dysphoric moods states, a special category of negative habits—rumination—may establish tendencies to interpret ambiguous events as personally relevant. As intuitively appealing as the last claim might be, however, we have not found relevant evidence in the literature, so we report two experiments that make a start in this direction. Our main goal was to demonstrate that the habit of focusing on oneself establishes *personal responses* to potentially impersonal situations.

As a method of instantiating a ruminative habit, we chose the manipulation created by Nolen-Hoeksema and her colleagues (e.g., Nolen-Hoeksema & Morrow, 1993). Experimental participants concentrate on a series of phrases and explore their meaning, slowly and deliberately, for about 8 min. Although the originators referred to these tasks as "rumination" and "distraction," they can be seen as thought-induction tasks, because the phrases are either self-focused ("my character and who I strive to be") or other-focused ("the smile on the face of the Mona Lisa" and other perceptual images). By invoking ruminative habits in the experimental setting, the self-focused induction should establish a bias that transfers to the interpretation of subsequent ambiguous events, whereas the other-focused induction (distraction) should discourage such transfer. This prediction is guided by a transfer-appropriate processing framework (Morris, Bransford, & Franks, 1977). In the domain of memory research, the effects of a particular manipulation at Time 1 on performance at Time 2 are stronger when the tasks on both occasions evoke similar cognitive processes, in comparison to dissimilar or mismatched processes. When words are studied in terms of what they mean

We thank Rebecca Grider, Nancy Liu, Jill Nile, and Ben Revilla for assistance in all phases of the research.

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0005-7894/06/0259–0268$1.00/0

instead of what they sound like, for example, they are better recalled in response to meaning-related cues on a test of explicit memory or more often produced as associations to meaning-related cues on a test of implicit memory; however, the reverse is true when the test cues are phonologically related to the word (see Blaxton, 1989). Processes that are similar across two occasions are deemed transfer-appropriate.

According to a transfer-appropriate processing framework and similar notions about contextual specificity, the point of view established by a thought-induction task should transfer to a subsequent interpretation task to the extent that both tasks vary along the same dimension. Clearly a primary dimension in the thought-induction task is the extent of personal meaning inherent in the phrases. So we developed a set of homographs, each with both personal and impersonal meanings (e.g., *close, console, express, loaf, kind, reflect, well*), to use in the interpretation task. Following a self-focused or other-focused induction, participants performed tasks on these homographs that allowed us to determine the nature of their interpretations. In Experiment 1, they created sentences, and in Experiment 2, they freely associated. We hypothesized that, compared to participants who focused on other matters in the thought-induction task, those who focused on the self would express personal interpretations of the homographs more frequently, particularly if they were dysphoric. The self-focused task should activate self-focused habits, presumably more prevalent in the thinking of depressed or dysphoric people (see Mor & Winquist, 2002; Pyszczynski & Greenberg, 1987; Roberts, Gilboa, & Gotlib, 1998).

In Experiment 2, we followed the free-association task with a test of free recall of the homographs to which they associated. The recall test served as a second measure of focus on the meaning of the homographs. The more meaningfully processed homographs should be better recalled (see Craik & Tulving, 1975), and we expected that personally interpreted homographs would be more meaningful to, and therefore better recalled by, dysphoric participants who had focused on the self.

A somewhat different question to be addressed in this paradigm is whether the habit of self-focus, as called forth by the thought-induction task, influences the *emotional valence* of interpretations in dysphoria. For depressed or dysphoric participants, the thought-induction task often has consequences similar to a mood-induction task; the self-focused condition makes them feel more depressed, and the other-focused condition makes them feel less depressed (e.g., Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998). Moreover, Lyubomirsky et al. discovered cognitive consequences of the self-focused induction for the production of negative autobiographical memories. In keeping with those findings, as well as the underlying notion that dysphoric participants' thoughts should be more emotionally negative during the self-focused induction, we hypothesized that dysphoric participants in the self-focused condition would produce more emotionally negative sentences, compared to those who had recently focused elsewhere. Increased negativity in the self-focused condition might reflect mood-congruent processing (if there is evidence for differential negativity in mood), thought-congruent processing (the transfer of cognitive habits), or both.

Experiment 1

In the first experiment, dysphoric and nondysphoric students underwent a thought-induction procedure in which they concentrated on a series of phrases that were either self-focused or other-focused for approximately 8 min (see Nolen-Hoeksema & Morrow, 1993). Subsequently, on each of 40 trials of the interpretation task an interpretation cue was presented, and they were asked to use this word in a sentence; 60% of these words were homographs with both personal and impersonal meanings, and the others were fillers with one primary meaning. We first predicted that self-focused thinking would cause participants, particularly dysphoric participants, to construct more sentences reflecting personal meanings of the homographs. Our second prediction was that more negatively emotional sentences would be created by the dysphoric participants who self-focused.

The interpretation trials were actually designed to be analogs for the experience of being reminded of one's previous thoughts while performing a new task. On 60% of the trials, prior to the presentation of the interpretation cue, either a new word or a trigger word from the induction procedure appeared at the top of the screen. Participants were asked to indicate whether this top word—the potential reminder—had occurred during the previous induction task. (The triggers were common to *both* induction conditions.) We did not entertain a specific prediction regarding the trigger trials, because being occasionally reminded of self-focused thoughts might be sufficient to exert the effect across all trials. Regardless, the outcome of this manipulation was uninformative, and therefore we omit most of the

associated details from the description of materials (in the interest of mental and physical economy).

Method

PARTICIPANTS AND DESIGN

Undergraduate students were given the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) during their introductory psychology course to assess their levels of dysphoric mood. Those who scored lower than 6 and higher than 9 were recruited for participation, and the experimenters who interacted with the participants were unaware of their BDI scores. (The scores of 6 through 9 were avoided in order to decrease attrition due to changes during the 1-to-2-week period between the class administration and the experimental session. Only 10% of the recruited dysphoric participants' scores fell below 12, which is akin to a score of 14 on the BDI-II—the cutoff for mild depression; Beck, Steer, & Brown, 1996.)

Under a constraint of equal cell sizes and approximately equal gender distributions, participants were randomly assigned to conditions of the thought-induction task. Those whose end-of-session BDI scores placed them out of the original categories of dysphoric or nondysphoric were replaced (7 from the dysphoric group and 4 from the nondysphoric group). The final sample in the self-focused condition included 18 dysphoric and 18 nondysphoric participants, 10 of whom were female and 8 male. The other-focused condition contained 18 participants from each mood category, 9 of each gender. This final sample of 72 participants excluded the data of 5 additional participants who failed to comply with instructions for the sentence-production task.

MATERIALS

Mood forms. In the initial mood form of the session, participants were asked to rate the extent to which their feelings "at this moment" corresponded to each of several adjectives (e.g., *dreamy, sad, angry, elated, curious, depressed*) by using a scale of 1 (not at all) to 9 (very) (Lyubomirsky et al., 1998). The second mood form, given after the induction phase, consisted of some of the same adjectives, plus additional ones, but in a different order than on the previous form. The participants' ratings for the adjectives *sad* and *depressed* were totaled separately for each form to constitute their two mood scores.

Thought-induction phrases. Nolen-Hoeksema and Morrow's (1993) rumination and distraction phrases were slightly modified to produce 50 phrases in each category (self-focused vs. other-focused, respectively) and displayed one per page in a booklet. Eight phrases in each set were constructed to contain identical "trigger" homographs to be used during the interpretation phase (Brozovich, 2003). For example, participants in the self-focused condition read, "your *character* and who you strive to be" (an original phrase from Nolen-Hoeksema & Morrow) whereas those in the other-focused group read, "a *character* on a computer keyboard" (a new phrase of our invention).

Interpretation cues. Interpretation cues consisted of 24 target homographs (not used in the induction phase) and 16 fillers. The target homographs were chosen from Twilley, Dixon, Taylor, and Clark (1994), based on whether at least one of their meanings was personal and another impersonal (*bitter, blunt, bug, close, console, deep, desert, down, dump, express, felt, firm, hound, kind, loaf, reflect, relish, sharp, shed, stable, strain, trip, vent, well*). Those with extreme differences in interpretation frequencies were avoided (for those chosen, M = .30 for personal meaning and .65 for impersonal meaning). In order to disguise the nature of the experiment, 16 filler words with one primary meaning were selected from Kucera and Francis (1967) and approximately matched with the homographs on word frequencies. One randomized-block order of interpretation cues was used for all participants. Each block contained three homographs and two fillers, randomly assigned, for a total of 40 trials.

PROCEDURE

The session was described as a collection of independent tasks and questionnaires. First, participants were asked to fill out the initial mood form and place it in an envelope to be delivered later to the supervising faculty member. Then the thought-induction task was described as a pilot for a later study that would examine the factors that facilitate concentration, with the implication that questions would follow. The participants received their assigned booklets (either self-focused or other-focused) and were asked to read and concentrate on each phrase in turn for 10 s. They were instructed not to turn the page until the tape-recorded beep sounded. When they completed this task, they were given the second mood form to complete and place in the envelope with the first form.

Next, we described the purpose of the interpretation task as an investigation of sentence construction, under conditions in which another, alternating task is also being performed

(recognition). All words were presented in bold black font on a white screen, programmed in Superlab Pro. We told participants that, because of this alternating task, on most of the trials a word would appear at the top of the screen. If a word appeared at the top (24 of the 40 trials), 3 s were allotted for the decision of whether the word was old (from the previous booklet) or new. Participants pressed "v" on the keyboard (relabeled as "o") for judgments of old and "n" for judgments of new. In the event that no word appeared at the top, participants were told to wait for the word at the bottom of the screen to appear (in 3 s). On every trial, an interpretation cue (homograph or filler) appeared at the bottom for 3 s. Participants were instructed to repeat this word aloud and then use it in a sentence. They were asked not to produce very elaborate sentences, but also not to use uninformative sentences (e.g., *It is a bug*). After saying each sentence, they pressed a space bar, and a + sign at the top of the screen indicated entry into the next trial. The spoken responses were recorded on tape and coded later. Participants were given four practice trials to ensure their understanding of the procedure before beginning the actual trials, at which point the experimenter left the room.

At the end of the session, prior to debriefing, participants filled out a second BDI, used to check whether they still belonged in the same mood category. They placed it in the envelope that contained the two mood forms and sealed it.

CODING

Taped responses to homographs during the interpretation phase were transcribed verbatim. Two raters independently coded all transcribed responses categorically, according to whether the sentence: (a) reflected personal or impersonal meaning (98% agreement, $\kappa = .95$) and (b) expressed positive, neutral, or negative emotion (77% agreement).[1] All disagreements were resolved by discussion without reference to condition.

Results and Discussion

MOOD SCORES

To examine effects of the thought-induction procedure on temporary mood, a mixed design ANOVA was performed with a within-subjects factor for the timing of the form (pre- vs. post-induction) and between-subjects factors for mood group (nondysphoric vs. dysphoric) and thought induction condition (self-focused vs. other-focused). The main effect for mood group was significant, $F(1, 68) = 37.60$, $MSE = 20.48$, $p < .001$. Means are reported in Table 1. The only other significant effect was the three-way interaction of group by induction by timing, $F(1, 68) = 4.35$, $MSE = 2.68$, $p = .041$. The simple interaction of timing and induction was nonsignificant for nondysphoric participants ($p = .231$) and only marginally significant for dysphoric participants, $F(1, 34) = 3.14$, $MSE = 2.34$, $p = .085$. As seen in Table 1, the pattern of means is in line with the typical finding that the self-focused induction impairs mood in dysphoria and the other-focused induction improves mood; however, the other-focused group started out with higher scores on the pretest. Clearly, the moods of the self-focused dysphoric participants at post-induction were no more negative than the relevant comparison scores.

PERCENTAGE OF HOMOGRAPHS INTERPRETED PERSONALLY

The primary dependent variable used to evaluate the consequences of self-focused attention was the percentage of homographs interpreted personally, instead of impersonally, according to the meaning expressed in the participants' sentences. This measure was submitted to a mixed design ANOVA, with between-subjects factors for mood group and induction procedure and a within-subjects factor for type of trial. Type of trial refers to whether triggers, new words, or nothing appeared at the top of the screen prior to the interpretation cue appearing at the bottom. All effects in this design were nonsignificant, $p > .10$. As is clear in the pattern of means presented in Table 1, our hypothesis concerning transfer effects of the thought induction procedure, alone or interacting with mood group, received no support, $Fs < 1.0$.

Dysphoric participants' personal interpretations of the homographs were more frequent than the normative frequency: (.30), $t(35) = 4.20$, $SE = 2.290$, $p < .001$. However, the same can be said of the nondysphoric participants: $t(35) = 2.53$, $SE = 1.975$, $p = .016$.

As an aside before turning away from this measure, we report a correlation between the percentage of homographs interpreted personally and scores on the Rumination on Sadness Scale (Conway, Csank, Holm, & Blake, 2000), which had also been administered in the introductory psychology classes and coded for this purpose. The

[1] We could not compute estimates of κ for the valence judgments, because the actual judgments involved in disagreements between raters were inadvertently discarded. When the judgments are conceptualized as negative versus nonnegative, agreement was 96%. The clear majority of disagreements thus concerned the difference between neutral and positive sentences.

Table 1
Means (Standard Deviations) in Experiment 1

	Nondysphoric		Dysphoric	
	Self-focused	Other-focused	Self-focused	Other-focused
Pre-induction	5.6 (3.2)	4.0 (1.8)	9.3 (4.1)	10.4 (3.5)
Post-induction	5.6 (3.2)	5.0 (2.4)	9.6 (4.1)	9.4 (4.3)
Session BDI scores	3.4 (1.8)	2.2 (1.2)	16.2 (6.4)	17.0 (6.5)
Percentage personal	35.3 (11.4)	34.7 (12.6)	40.2 (13.2)	39.0 (13.6)

Note. $n = 18$. "Percentage personal" refers to the percentage of homographs that were interpreted personally.

correlation was modest but significant, $r(70) = .26$, $p = .029$, and indicates that participants who reportedly ruminate when they are sad tended to interpret homographs personally.

PERCENTAGE OF SENTENCES WITH NEGATIVE EMOTIONAL MEANING

The percentage of sentences that were judged to be emotionally negative served as the next dependent variable in an ANOVA, with between-subjects factors for mood group and induction procedure. The main effect of induction procedure was significant, $F(1, 68) = 6.22$, $MSE = 129.9$, $p = .015$. Although this effect did not depend on mood group ($F < 1.0$), our hypothesis pertained to dysphoric participants in particular, and therefore we performed a priori tests of the effect within each mood group. Clearly, self-focused thoughts made interpretations more negative in the dysphoric group, $t(34) = 2.29$, $SE = 3.963$, $p = .028$. As shown in Figure 1, 39% of interpretations in the self-focused condition were negative ($SD = 12.78$), on average, compared to 30% in the other-focused condition ($SD = 10.92$). The corresponding mean percentages in the nondysphoric group were 36 and 32 (SDs = 12.22 and 9.35)—a difference that was not significant, $t(34) = 1.19$, $SE = 3.627$, $p = .243$.[2] Overall, the percentage of negative interpretations was significantly correlated with the percentage of personal interpretations, $r(70) = .31$, $p = .009$.

Experiment 2

In a second attempt to examine potential transfer effects of cognitive habits, Experiment 2 was conducted without reminders about the induction task. With hindsight, we were concerned that reminders might even interfere by establishing too analytic a set for the transfer of a self-focused perspective. At least one nondysphoric participant (whose data were set aside) had created several sentences containing *both* meanings of the homographs. Also following that line of reasoning, we changed the interpretation task to one that fosters a less analytic set: free association. (Because we requested one-word responses, the valence of the association was heavily constrained by the valence of the homograph itself, and so the hypothesis about emotional valence could not be adequately separated from the hypothesis about personal meaning.)

Finally, a new procedure was included in Experiment 2. Following the interpretation task, we surprised the participants with a request to recall the cues for free association. Perhaps even more important than the degree of personal meaning initially taken from an ambiguous event is the degree to which that personal interpretation is subsequently remembered. The prediction for this task was that dysphoric students in particular should recall more of the homographs that they had interpreted

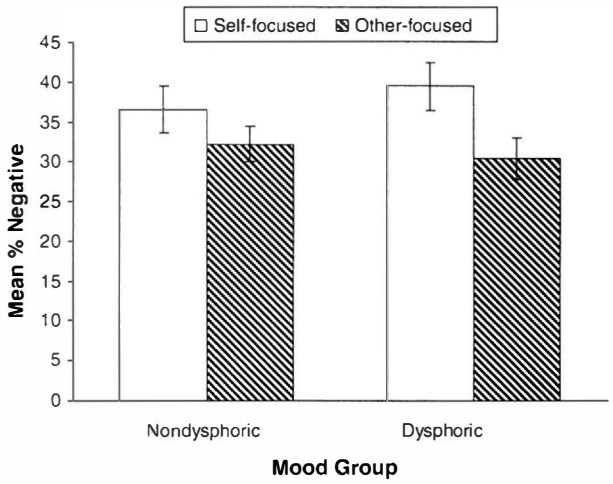

FIGURE 1 Mean percentages of sentences judged to be negatively emotional in each mood group and condition of the thought-induction task (Experiment 1). Error bars represent standard errors.

[2] ANOVA on the percentage of neutral interpretations revealed only a marginally significant main effect of induction, $F(1, 64) = 3.12$, $MSE = 210.52$, $p < .10$. The percentage was higher in the other-focused condition, but neither simple main effect within each mood group approached significance, $p > .15$. A similar analysis performed on the percentage of positive interpretations revealed no significant effects, Fs < 1.0.

personally if their self-focusing habits had been activated by the induction procedure. Such an outcome would reflect a stronger focus on personal meaning in the interpretations.

Method

PARTICIPANTS AND DESIGN

Using the same selection procedure and criteria as in Experiment 1, we randomly assigned dysphoric and nondysphoric participants to the self-focused and other-focused thought-induction task, with the constraint of equal cell sizes. After the data from participants who changed their mood conditions were set aside (n = 6 in each mood group), 8 female and 8 male students participated in each combination of mood group and induction task, for a total of 64 participants.

MATERIALS AND PROCEDURE

All materials and procedures were identical to those in Experiment 1, with the following exceptions. In the interpretation task, 12 fillers and 12 homographs (*bitter, blue, console, deep, dump, express, glare, odd, stable, tear, vent,* and *well*) were arranged in a randomized block order, with each block containing two fillers and two homographs. (With the omission of the reminders, the design required fewer homographs; fewer were also preferred on the basis of reduced awareness of their homographic quality.) The words were presented for 2 s each, followed by a blank screen. Participants were instructed to read each word aloud and then to blurt out the first two words that came to mind. Although we planned to evaluate the meaning of the first word only, we requested two words to reduce any tendency to choose a "best" response. After producing two responses, participants advanced the program to the next trial. All responses were taped, with the experimenter absent from the room.

Another change from Experiment 1 was the inclusion of three filler tasks at the very beginning of the session, in order to make a more convincing case for the session consisting of a collection of unrelated tasks. These tasks included 2 min of spatial problem-solving, 5 min of finding hidden objects in pictures, and a bogus test of color preferences. They were followed by the first mood form, the thought-induction task, the second mood form, and the free-association test. (Participants were told that their associations would guide choices for later experiments.) Then, participants were handed a sheet of blank paper and asked to recall the cues for association—the words presented on the screen during the previous task. Unlimited time was allowed. The final procedure was the administration of the BDI.

The first responses to homographs during the free-association task were transcribed from the tape and independently coded by two raters for the extent to which they reflected personal or impersonal meaning. The raters agreed about 96% of the responses (κ = .92) and resolved their disagreements without reference to condition.

Results and Discussion

MOOD SCORES

As in Experiment 1, the ratings on the "sad" and "depressed" scales were summed for each mood form, although three participants (1 dysphoric and 2 nondysphoric) were missing rating data, having failed to turn over the pages. These scores were submitted to a mixed design ANOVA, with between-subjects factors for mood group and induction task and a within-subjects factor for timing (pre- and post-induction). Dysphoric students produced higher scores, regardless of timing or induction, $F(1, 57) = 47.33$, $MSE = 16.16$, $p < .001$. Means are presented in Table 2. The only other significant effect was the interaction of mood group and timing, $F(1, 57) = 6.69$, $MSE = 3.55$, $p = .012$. Both mood groups' scores tended to regress to the overall mean. Again, the dysphoric data did not replicate Nolen-Hoeksema and Morrow's (1993) results.

Table 2
Means (Standard Deviations) in Experiment 2

	Nondysphoric		Dysphoric	
	Self-focused	Other-focused	Self-focused	Other-focused
Pre-induction	3.4 (1.6)	4.9 (2.5)	10.0 (3.7)	10.2 (3.7)
Post-induction	5.1 (3.0)	5.9 (3.5)	10.1 (3.1)	9.2 (3.4)
Session BDI scores	2.5 (1.9)	2.9 (2.2)	13.6 (4.3)	15.8 (5.2)
Percentage personal	45.0 (22.0)	54.9 (16.3)	51.8 (18.4)	44.6 (19.1)

Note. n = 16, but only 15 for mood ratings in the nondysphoric condition and in the dysphoric/self condition. "Percentage personal" refers to the percentage of homographs that were interpreted personally.

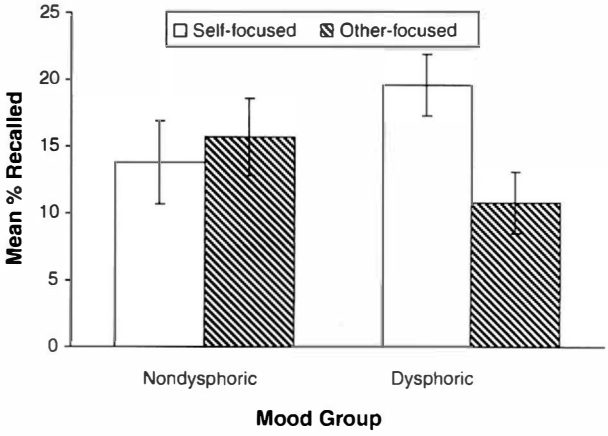

FIGURE 2 Mean percentages of personally interpreted homographs recalled in each mood group and condition of the thought-induction task (Experiment 2). Error bars represent standard errors.

PERCENTAGE OF HOMOGRAPHS INTERPRETED PERSONALLY

Due to a programming error on one computer, one of the homographs was not displayed during the free association task for 30 participants (7 nondysphoric self-focused, 8 nondysphoric other-focused, 8 dysphoric self-focused, and 7 dysphoric other-focused). Therefore, the dependent measure was the percentage of homographs interpreted personally, out of either 11 or 12 total. An initial analysis included "computer" as a factor and revealed no significant effects associated with the programming error. Therefore, this percentage was submitted to an ANOVA with between-subjects factors for mood group, induction procedure, and gender. Gender was included in the design as a means of reducing error variance; we held no expectations about the interaction of gender with the variables of interest.[3]

As shown in Table 2, the interaction of mood group with induction condition was significant, $F(1, 56) = 4.55$, $MSE = 259.54$, $p = .037$. Dysphoric students interpreted homographs personally more frequently following the self-focused induction, whereas nondysphoric students showed the opposite pattern. However, these simple main effects were nonsignificant; in the dysphoric group, $F(1, 28) = 1.75$, $MSE = 242.71$, $p = .20$; in the nondysphoric group, $F(1, 28) = 2.83$, $MSE = 276.37$, $p = .10$.

PERCENTAGE OF HOMOGRAPHS RECALLED

The percentages of personally interpreted homographs that were subsequently recalled were submitted to an ANOVA with between-subjects factors for mood group, induction procedure, and gender. The interaction of induction procedure with mood group was significant, $F(1, 56) = 4.52$, $MSE = 100.48$, $p = .038$. Illustrated in Figure 2, dysphoric participants assigned to self-focus recalled a higher percentage than did those assigned to focus on other matters ($M = 20\%$ vs. 11%, SDs = 9.34 and 9.08, respectively), $F(1, 28) = 8.31$, $MSE = 73.87$, $p = .007$. The corresponding difference for nondysphoric participants ($M = 14\%$ vs. 16%, SDs = 12.24 and 11.64, respectively) was nonsignificant, $F < 1.0$.[4] (In an analysis of the percentage of impersonally interpreted homographs recalled, all effects were nonsignificant, Fs < 1.0, $M = 17\%$.)

General Discussion

Together, these two experiments provide some useful evidence concerning the cognitive consequences of self-focused attention for the interpretation of ambiguous words by dysphoric students. In Experiment 1, a period of self-focus led them to construct more emotionally negative sentences, although not ones that implicated more personal interpretations of the homographs. In Experiment 2, self-focus tended to cause more personal interpretations, at least in contrast to the opposite pattern shown by nondysphoric students. Moreover, when the dysphoric students were self-focused they later recalled a higher percentage of personally interpreted homographs. We address each finding in turn.

In Experiment 1, self-focused dysphoric students constructed more emotionally negative sentences in response to the homographs than did those in the other-focused condition. This effect might be thought of as a mood-congruent effect if the self-focused induction had actually caused dysphoric

[3] Gender was also initially included as a factor in the Experiment 1 analyses and then excluded because it did not sufficiently reduce error variance to change any of the reported outcomes. In Experiment 2, the inclusion of gender helped to increase power in analyses of interpretations. Female students made more personal free associations than did male students, $F(1, 56) = 26.09$, $MSE = 259.54$, $p < .001$. All other effects involving gender were nonsignificant, Fs < 1.0.

[4] The only significant effect involving gender in the analysis of recall data was the three-way interaction of gender, induction, and mood group, $F(1, 56) = 9.54$, $MSE = 100.48$, $p = .003$. Follow-up tests, to be interpreted cautiously because the cell sizes were small ($n = 8$), indicated that the pattern illustrated in Figure 2 was exaggerated for male students and not significant for female students. Again, we included the gender factor as a method of reducing error variance. Even without its inclusion, however, the interaction of induction and mood group was significant, $F(1, 60) = 3.99$, $MSE = 113.74$, $p = .050$; and so was the simple main effect of induction procedure within the dysphoric group, $F(1, 30) = 7.24$, $MSE = 84.82$, $p = .012$.

participants to feel sadder than if they had been distracted by other matters. Because it did not, it is probably better to think of the effect as primarily cognitive instead of affective. Thinking unhappy thoughts about self likely transferred to thinking negative thoughts about the homographs. Although the interaction of induction procedure with mood group was nonsignificant, the sentences created by nondysphoric students did not reveal a significant effect of thought induction. Nevertheless, the overall level of negativity in both mood groups was sizable. In that regard it is important to keep in mind that the valence of the sentence must have depended in part on the valence of the homographs' meanings, and clearly we chose a number of homographs with emotionally negative interpretations. The percentage of negative interpretations was significantly correlated with the percentage of personal interpretations.

Turning now to the personal versus impersonal nature of the homographs' meanings, we conclude that Experiment 1 provided no support for the main hypothesis concerning the transfer of self-focusing effects. The sentences constructed by dysphoric participants expressed the personal meanings of the homographs nondifferentially in the two induction conditions and no more frequently than did the sentences produced by nondysphoric students. If and when such transfer of personal focus occurs, we now surmise that it is likely to be automatically achieved and potentially disrupted by other cognitive concerns. Perhaps the use of reminders during the interpretation task interfered by encouraging participants to monitor their thoughts. Even the very task of creating sentences might itself be too "forced" to reflect the operation of relatively automatic habits. In sidestepping these possibilities, we excluded reminders and employed a more reflexive interpretation task in Experiment 2.

In Experiment 2, the effect of self-focus, although not significant for the dysphoric participants, was in the hypothesized direction, in contrast to the opposite direction in the nondysphoric group. The interaction was significant, but due in part to low variance associated with the main effect of induction, the interaction did not partition into significant simple main effects within either mood group. Responses were quite variable; therefore power was low. Among factors possibly responsible for low power was the small separation between the mood groups. In particular, the scores on the end-of-session BDI in the self-focused condition fell to low levels (M = 13.6). Obviously, that outcome suggests the collection of data from more clearly depressed individuals in the future. Another potentially useful procedure would be to recruit and assign participants according to their tendency to ruminate; one might thereby find effects of thought induction for those who typically ruminate and not for others. In that vein, Experiment 1 did reveal a modest but significant relationship between rumination and the tendency to make personal interpretations.

In the meantime, until such research is performed, we emphasize the recall data in Experiment 2, which provide solid evidence for the transfer of cognitive habits along a self-referential or person-oriented dimension. The self-focused dysphoric participants recalled a higher percentage of the homographs that they had interpreted personally, compared to the other-focused dysphoric participants. In short, although they did not make significantly more personal interpretations in the self-focused condition, they seemed to have made them at a more meaningful or attentive level that facilitated their subsequent recall.

The effect on free recall provides an experimental model for aspects of ruminative remembering. When we ruminate about our experience we construct processing episodes that themselves are remembered, potentially in place of the original episode. So, even though reasoning from homographic free associations to real-life events is a stretch, it is tempting to speculate that the personal interpretation is the "event" that is subsequently recalled, particularly well under conditions of depressive rumination and self-focus. In the course of habitual cognition, recall of personal interpretations potentially returns the "favor" by exacerbating future tendencies to "take things personally."

The two experiments described in this report are novel in their exploration of cognitive consequences of self-focused thoughts for the tendency to "take things personally." By using Nolen-Hoeksema and Morrow's (1993) rumination and distraction procedures, previous research has explored the cognitive consequences of self-focused thinking on other measures of cognition in depression and dysphoria. We mention just a few examples. Dysphoric students who have undergone a self-focused induction (compared to those who were other-focused) have been shown to experience an enhanced sense of insightfulness but greater pessimism about positive events in their future, and they have been found to generate fewer effective solutions to interpersonal problems and more negative responses to imagined problem situations (Lyubormirsky & Nolen-Hoeksema, 1993, 1995). Evidence for effects on memory tasks has also been obtained by using thought-induction procedures. A dysphoria-related disruption in the more attention-

demanding, deliberate component of remembering was found following the self-focused but not the other-focused induction (Hertel, 1998). Also, measures of autobiographical memory have been affected by thought-induction procedures. Compared to the self-focused procedure, the other-focused or distracting procedure reduced the number of categorical, overly general memories recalled by dysphoric and depressed participants (Watkins, Teasdale, & Williams, 2000), as well as the negativity of such memories (Lyubomirsky et al., 1998).

More generally, the current experiments are among the few to find experimental evidence of interpretive biases in dysphoria and depression (see Mathews & MacLeod, 2005). Probably the clearest evidence of interpretive bias in dysphoria was revealed quite indirectly. Lawson, MacLeod, and Hammond (2002) measured the blink reflex in response to noise presented during an imagery task. Participants imaged situations evoked by aurally presented ambiguous and nonambiguous words. Dysphoric participants produced particularly amplified blink reflexes during the imaging of emotionally negative words and similarly amplified reflexes during the imaging of ambiguous words with possible negative interpretations. According to these results, as well as the current report, procedures might be more likely to reveal interpretive biases to the extent that they invite habitual processes (see Hertel, 2004).

Dysphoria is a term that refers to nondiagnosed negative affect, of the sort that is measured by the BDI. Scores on the BDI are highly correlated with trait anxiety measures. Plainly, anxiety experienced by our dysphoric participants might be at least partly responsible for the pattern of results, because interpretive biases have frequently been demonstrated in anxiety (e.g., Eysenck, Mogg, May, Richards, & Mathews, 1991; MacLeod & Cohen, 1993). Recently, anxiety-related interpretive biases have been successfully modeled in nonanxious groups (e.g., Mathews & Mackintosh, 2000). Like our use of the thought-induction tasks, these experiments developed interpretive habits in an initial phase, which subsequently produced transfer effects, even on dissimilar tasks (e.g., Hertel, Mathews, Peterson, & Kintner, 2003) and following delays (Yiend, Mackintosh, & Mathews, 2005). It is worth considering that transfer-appropriate processes operating from one task to another might ultimately be more important to understanding biases than whether the individual is primarily depressed or anxious, especially considering the overlap in symptoms (see Nolen-Hoeksema, 2000). Moreover, in deciding about nonpharmacological treatment, it might be just as important to understand the cognitive habits of individuals who are depressed or anxious as it is to find the right diagnostic category.

Implications for Clinical Practice

Although only a few studies have found evidence of interpretive biases in depressed or dysphoric samples, such biases are taken for granted by practicing psychotherapists. Changing the cognitive habits of depressed clients has long been a cornerstone of cognitive-behavioral therapy. Some of those practices, known as cognitive restructuring, call to the client's attention the multiple interpretations of ambiguous events in an effort to encourage impersonal interpretations (e.g., Is it possible that she didn't return your call because she is out of town, not because she is avoiding you?). Clearly it is impossible to change habits without first revealing them. However, one drawback to a therapeutic focus on interpretations is the possible strengthening of the habit to interpret personally, particularly when homework for cognitive restructuring is difficult to get under way. Under the latter conditions, the transfer-appropriate processing approach suggests a potentially useful alternative. The alternative is simply to sidestep cognitive habits instead of arguing with them. Directing clients who ruminate unproductively to notice and subsequently turn their attention to unrelated but compelling topics, ideally agreed upon in advance, takes advantage of the usefulness of distraction in possibly improving mood (Nolen-Hoeksema & Morrow, 1993) and weakening the ruminative cycle. Even the brute-force method of suppressing undesirable thoughts has been shown to decrease their subsequent occurrence, particularly by individuals with major depressive disorder (e.g., Joormann, Hertel, Brozovich, & Gotlib, 2005). Thought substitutes are helpful in this process, at least in nondiagnosed samples (Hertel & Calcaterra, 2005). Some suppressed thoughts seem to rebound later on their own steam (Wegner, 1994), but clearly much work remains if we are to understand why some seem to rebound whereas others can be suppressed to the point of being inaccessible during intentional recall (Joormann et al., 2005).

Of course, speculations about therapeutic practices wander far from the data we present, but our investigation and these speculations both derive from an understanding of ruminative thinking as habit in a rather old-fashioned behavioral sense. The way to extinguish one behavior is to practice doing something different instead. The way to stop

perceiving and remembering the ambiguous as personal is to do something that turns the focus of attention away from self.

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RECEIVED: July 7, 2005
ACCEPTED: January 25, 2006
Available online 26 May 2006