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# Interpretation bias and depressive symptoms: The role of self-relevance

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# ABSTRACT

Cognitive theories of depression emphasize negatively biased interpretations as an important target of therapy. Much of the research on interpretation bias in depression has focused on selection, or deciding which of several interpretations is likely. However, depressive biases may also exist in the generation of possible interpretations, or the ability to think of positive alternatives. If biases exist for generation as well as selection, therapeutic techniques to encourage the generation of more positive interpretations would be warranted. Asking therapy clients to consider someone else in a similar situation is a commonly used therapy strategy but has not been sufficiently examined empirically. In the current studies, we examine interpretation generation and selection in dysphoric and nondysphoric individuals, and contrast interpretations made for the self to interpretations made for two types of "other." Our studies reveal depressive biases in both interpretation generation and selection, and indicate that interpretation valence is highly sensitive to the type of other considered. All participants generated and selected significantly more positive interpretations for friends than for themselves, but generated significantly more negative interpretations for hypothetical others than for themselves. Our results suggest that encouraging dysphoric individuals to imagine others can be beneficial, but the type of "other" used is critically important, with instructions to consider a close friend most likely to be effective in decreasing negativity in interpretation.

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Cognitive theories assign an important role to the interpretation of ambiguous situations in the development and maintenance of emotional disorders (Beck, 1967). Negative interpretations are thought to maintain depressive symptoms through a variety of mechanisms, including support of negative self-beliefs and reinforcement of negative memory biases (Beck, 1967; Hertel, Brozovich, Joormann, & Gotlib, 2008). Cognitive behavioral treatments encourage depressed individuals to challenge the validity of their negative interpretations and to generate alternative ways of viewing potentially negative situations (Beck, 1995; Greenberger & Padesky, 1995; Leahy & Holland, 2000). While some aspects of negative interpretation biases in depression have been extensively studied, the process of generating multiple interpretations for a single situation has yet to be examined. Further, cognitive behavioral treatments often encourage depressed individuals to consider how they would interpret situations if they happened to others, but the effects of such instructions on interpretations have not been sufficiently studied experimentally. In the studies presented here, we examined the generation of multiple interpretations and the effects of instructions to generate self-relevant or

other-relevant interpretations on the valence of interpretations generated and selected by dysphoric and nondysphoric individuals. A greater understanding of both the process of generation and the influence of self-relevance could inform cognitive theories of depression and therapeutic interventions designed to modify negative interpretation biases in depression.

# Generation of multiple interpretations

Interpretation is the process of assigning meaning to a situation or stimulus whose valence is unclear (e.g., Amir, Foa, & Coles, 1998). Interpretation of ambiguous situations involves the generation of multiple possible interpretations followed by the selection of a single interpretation as most likely (Huppert, Pasupuleti, Foa, & Mathews, 2007). These processes are related because generation constrains the possible interpretations available for selection. In order to select an interpretation as the likely explanation for a situation, one must first think of that interpretation as one of the possible options. Much of the interpretation bias research in depression has used methodologies that assess interpretation selection but not generation. For example, much of this literature utilizes self-report questionnaires which provide a list of possible interpretations for an ambiguous situation from which participants choose a single response (e.g., the Cognitive Bias Questionnaire;

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Krantz & Hammen, 1979). Several studies have found that depressed individuals select more negative responses on such measures than nondepressed individuals (e.g., Carver, Ganellen, & Behar-Mitrani, 1985; Krantz & Hammen, 1979; Miller & Norman, 1986).

Other research has focused on interpretations of experimentally controlled social interactions. Compared to controls, depressed individuals agree more with negative feedback about their performance in such situations (Cane & Gotlib, 1985) and rate videotaped interactions directed towards themselves as more negative (Hoehn-Hyde, Schlottmann, & Rush, 1982). More recently, researchers have used performance-based measures that assess biases in the resolution of ambiguous homophones (e.g., die/dye) or priming effects of ambiguous sentences which could have either negative or neutral meanings (e.g., "the doctor examined little Emily's growth," referring to cancer or height; Bisson & Sears, 2007; Holmes, Lang, Moulds, & Steele, 2008; Lawson & MacLeod, 1999; Mogg, Bradbury, & Bradley, 2006). In contrast to self-report measures, many of the studies using performance-based measures have not found evidence of interpretation biases in depression. This may be due to the nature of the stimuli used, which are often not self-relevant and not specific to themes of loss or sadness, or to the type of process assessed by such measures (Wisco, 2009). Although performance-based measures have many advantages over selfreport questionnaires (Nisbett & Wilson, 1977), the tasks used have not asked participants to report more than one interpretation per stimulus and have therefore not been able to assess interpretation generation.

To our knowledge, no studies to date have examined depressive biases in the generation of multiple interpretations for a single situation. Determining whether depressive biases emerge in interpretation generation, selection, or both, can inform both cognitive theory and therapeutic interventions designed to target interpretations. For example, if depressive biases emerge in the generation of interpretations, training in the generation of alternative, more positive interventions might be useful. However, if individuals with depressive symptoms generate positive interpretations easily but dismiss them as unlikely, such an intervention would not be warranted.

# The role of self-relevance in interpretation biases

Clarifying the role of self-relevance in depressive interpretation biases could also have important treatment implications. Cognitive therapy manuals suggest that therapists can help clients generate alternative, more positive interpretations by encouraging clients to consider what they would think if the same situation happened to someone else (Beck, 1995; Greenberger & Padesky, 1995; Leahy & Holland, 2000). This technique is based on evidence that cognitive biases in depression are less pronounced for others than for the self. Although much of the interpretation bias literature in depression has not manipulated self-relevance, a few studies have contrasted self-relevant with other-relevant interpretations in depression (Wisco, 2009). Hoehn-Hyde et al. (1982) found that depressed individuals rated videotaped social interactions as more negative than controls only if instructed to imagine the videos were directed towards themselves, rather than someone else whose back was visible in the scene. Cognitive processes other than interpretation are also more negative for the self than for others in depressed individuals. When asked to make attributions about the causes of self-relevant situations, depressed individuals demonstrate a negative attributional style (Mezulis, Abramson, Hyde, & Hankin, 2004). But when asked to make attributions for others, including close friends, romantic partners, a typical undergraduate, or a generic "other" person, depressed individuals are not more likely to make negative attributions (Schlenker & Britt, 1996; Sweeney, Shaeffer, & Golin, 1982). When asked to imagine selfrelevant future events, individuals with depressive symptoms are more pessimistic and imagine positive events less vividly than individuals without depressive symptoms (Alloy & Ahrens, 1987; Garber & Hollon, 1980; Holmes et al., 2008; Pyszczynski, Holt, & Greenberg, 1987; Stöber, 2000). Moreover, depressed individuals are more pessimistic for themselves than for others, including hypothetical students, the typical undergraduate, or a confederate (Alloy & Ahrens, 1987; Garber & Hollon, 1980; Pyszczynski et al., 1987).

However, contradictory evidence suggests that depressed individuals are motivated to view others in an even more negative light than they view themselves. Wills' (1981) theory of downward social comparisons argues that individuals sometimes compare themselves to others who are worse off as a means of selfenhancement. Because downward social comparisons are especially common when in distress, some have argued that depressed individuals are particularly likely to make downward social comparisons (e.g., Wenzlaff & Beevers, 1998). Indeed, depressed individuals prefer to retrieve information about others who are worse off than themselves (Gibbons, 1986), and when asked to question someone described as happy, depressed individuals prefer to solicit negative information from them (Wenzlaff & Beevers, 1998). If depressed individuals are motivated to view others negatively, their interpretations might be even more negative for others than for themselves. Thus, asking depressed individuals to imagine another in the same situation may not be beneficial and may in fact encourage more negative interpretations.

The type of "other" considered may also contribute to interpretation valence. Therapeutic interventions include either instructions to consider what one would think if the same situation happened to a specific person (e.g., "... have the patient imagine that the identical situation is happening to a specific friend and that she is giving the friend advice," Beck, 1995, p. 114) or more general instructions to consider "someone else" in the situation (e.g., "Ask 'Would you apply the same thought (interpretation, standard) to others as you do to yourself?," Leahy & Holland, 2000, p. 307). Some evidence suggests that encouraging therapy clients to consider a specific, familiar other person may be more effective than general instructions to consider "someone else" or "others." Social cognitive research on false consensus shows that individuals consult their own mental states in order to infer the mental states of others (Marks & Miller, 1987; Nickerson, 1999), and that individuals are especially likely to rely upon self-relevant thinking when they have few cues as to what the other person would think (Gendolla & Wicklund, 2009). If interpretations made for generic or nonfamiliar others are heavily influenced by self-relevant thinking, interpretation valence is unlikely to change. Therefore, instructions to consider a specific familiar individual may be most effective in modifying interpretation valence.

In addition to changing interpretation valence, considering others may reduce the amount of distress associated with potentially negative situations for dysphoric individuals simply by shifting focus away from the self. A large literature on rumination shows that dysphoric participants feel worse after engaging in passive self-reflection (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). When asked to focus on non self-relevant material, however, dysphorics experience temporary relief from negative mood (Nolen-Hoeksema et al., 2008). Other research suggests that one can reduce distress associated with negative self-relevant thoughts by changing one's relationship to the thoughts, rather than altering their valence (Masuda et al., 2009). When asked to recall negative autobiographical memories, the type of selfperspective adopted can change the emotional impact of the memories. Individuals who are encouraged to adopt an "immersed" stance (i.e., viewing the memory through their own eyes) are more emotionally reactive to negative memories than participants who are encouraged to adopt a "distanced" stance (i.e., taking a step back and seeing themselves in the memory; Kross, Ayduk, & Mischel, 2005). Therefore, adopting a distanced perspective, or viewing oneself as an "other," can reduce the emotional impact of negative thinking. Considering others might similarly lessen the emotional impact of interpreting ambiguous situations for dysphoric individuals.

In the current studies, we examine the effects of depressive symptoms and the self-relevance of interpretations on both the distress associated with interpretations and their valence. These studies extend existing research by examining interpretation generation as well as selection and by comparing interpretations made for the self to interpretations made for specific close friends and for hypothetical others.

# Study 1

Dysphoric and nondysphoric participants were randomly assigned to make interpretations for themselves or for a close friend. We examined how the self-relevance of interpretations affects their valence and participants' subsequent mood.

# Method

## Participants

Ninety-eight participants were recruited from flyers posted on a university campus and in the community and through the Psychology Subject Pool and were compensated with either a payment of 15 US dollars or one hour of research participation credit. Age ranged from 18 to 31 years, with a mean of 21.4. Thirty seven males (37.8%) and 61 females (62.2%) participated in this study; 45 participants (45.9%) described themselves as White, 23 (23.5%) as Asian, 11 (11.2%) as Hispanic, 11 (11.2%) as Black or African-American, six (6.1%) as Multiracial, and one (1.0%) as American Indian.

#### Materials

Interpretation bias questionnaire (IBQ). This measure was created by the authors for use in this study. The questionnaire presents vignettes describing ambiguous everyday situations. For example, one of the vignettes from the self-version reads "You call a good friend of yours and leave a message suggesting getting together later in the week. A few days pass, and you haven't heard from them. Why haven't they returned your call?" In pilot work, eleven volunteers completed a longer version of the measure, and we selected the ten vignettes rated as easiest to imagine and for which participants generated a mean of at least 3 interpretations (see Appendix for the full text of all ten vignettes).

Participants were instructed either to imagine that this situation happened to themselves (self-version) or to a close friend. Participants assigned to the close friend version were asked to identify one close friend of their gender, to write down the first name of this individual, and then to imagine that each of the situations in this questionnaire happened to that friend. The close friend version was modified so that it was written in the third person. After imagining the scenarios in the questionnaire, participants answered a question about their interpretation of the situation by writing down all explanations that came to mind (interpretation generation). Participants also selected the one interpretation that they deemed the "most likely" explanation for the situation by circling one of their responses (interpretation selection).

To ensure that participants understood the directions, a practice vignette was completed and reviewed by the experimenter. If the participant only wrote down one response for the practice situation, the experimenter prompted them by saying "Is this the only interpretation that came to mind?" to ensure that the participant understood the instruction to write down all interpretations, the experimenter prompted them by saying "Please circle the one response that you believe is most likely." After reviewing the practice vignette, the experimenter instructed the participant to complete the rest of the vignettes "at your own pace."

*Interpretation ratings-participant.* After completing the entire IBQ, participants rated the valence of each of the interpretations they had generated, rating the positivity and negativity of the interpretations on Likert-type scales from 1 (not at all) to 5 (extremely). Composite valence scores were computed in order to reduce the total number of analyses conducted. Valence scores were computed for each interpretation by subtracting the negativity score from the positivity score, thus giving a score ranging from -4 to 4, with higher numbers corresponding to more positive interpretation. For the index of interpretation generated by each participant. Our measure of interpretation selection consisted of the mean valence of the ten interpretations selected as most likely (recall that each participant selected one interpretation as most likely for each of the ten vignettes).

Interpretation ratings-coder. All responses were also coded by two independent coders who were blind to participant condition and dysphoria status, using the same five-point Likert scales. A coding manual included sample interpretations as anchors. "Negative" was operationalized as being any interpretation that reflected poorly upon the participant or had negative consequences for his/her life and "positive" as including a positive portrayal of the participant or suggesting beneficial outcomes for him/her.

Before being given to coders, all participant responses were typed, entered into a database, and put in random order. Coders were therefore unaware of which responses came from the same participants, reducing the possibility of bias. Coders demonstrated adequate interrater reliability and agreement for ratings of positivity (ICC = .88;  $\kappa$  = .78) and negativity (ICC = .92;  $\kappa$  = .78), and all discrepancies were resolved by consensus. Mean valence scores were again computed for indices of interpretation generation and selection.

State mood measures. Participants were asked to describe themselves "right now" by completing a series of ratings on a scale from 1 to 9 at two different time points in the experiment. Embedded within several distracter ratings (e.g., not creative-very creative, tame-wild) were three mood ratings of interest (not happy-happy, not sad-sad, and not depressed-depressed). The happiness rating was reverse-scored and the three items were summed to form a single mood rating (Cronbach's  $\alpha$  = .888 at Time 1 and .891 at Time 2), with higher numbers corresponding to more negative mood. This measure is particularly well-suited to repeated assessments because the purpose of the measure is hidden by the distracter items. These scales have been used extensively in previous research as measures of state-like mood (e.g., Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998; Rusting & Nolen-Hoeksema, 1998).

*Beck Depression Inventory-II (BDI-II).* The BDI-II is a widely used self-report measure with well-documented reliability and validity. The BDI-II includes 21 items that are summed to serve as an index of severity of depressive symptoms (Beck, Steer, & Brown, 1996).

Additional questions. On the IBQ, we attempted to present situations that were relevant to the lives of young adults. In order to examine whether the scenarios presented were appropriate for these participants, we included the question "How easy was it to imagine yourself/your friend in this situation?" for each of the ten vignettes. Participants selected one from the following responses: "very easy," "easy", "not easy or difficult," "difficult," or "very difficult" and made these ratings at the same time they rated the valence of their interpretations. For ease of presentation, this categorical measure was converted to a dimensional scale, with a score of 1 corresponding "very easy" and 5 corresponding to "very difficult," and the average response was computed.

Finally, participants were asked "To what extent were you thinking of yourself while completing the interpretation questionnaires?" at the end of the experiment to assess the degree to which they were reflecting upon their own experiences to make inferences for either their own or their friends' experiences. Participants rated this question on a Likert-type scale from 1 ("not at all") to 7 ("a lot").

#### Procedure

Individuals who expressed interest in the study first completed a prescreening questionnaire. The prescreen was a modified version of the BDI-II including all questions except one item assessing suicidal ideation, which was removed due to ethical concerns about the possibility of appropriate follow-up to an emailed questionnaire. Adopting commonly used cut-offs (e.g., Lyubomirsky et al., 1998), individuals who scored below 9 (control) or above 16 (dysphoric) on the prescreen were invited to participate. Participants completed the study within two weeks of completing the prescreen. The full BDI-II was administered at the time of testing, and only participants who met the cut-off criteria at the time of testing were included in the final analyses. Participants were randomly assigned to "self" or "close friend" conditions such that approximately equal numbers of dysphoric and nondysphoric participants were allotted to each condition. All participants met individually with an experimenter. Participants provided informed consent, rated their mood, completed the IBQ, then completed the interpretation ratings, rated their mood a second time, and completed the full BDI-II. Participants were not aware that they would be making ratings of their interpretations until after they had completed the entire IBQ.

# Results

Five participants reported BDI-II scores at the time of testing that were outside the cut-offs and were excluded from the following analyses. At the time of testing, the dysphoric group reported BDI-II scores ranging from 16 to 44, with a mean score of 24.1 (SD = 6.9). Of the dysphoric participants, 44 (95.7%) reporting a symptom duration of two weeks or longer. Age of participants did not differ significantly by condition or by dysphoria status, Fs < 0.4, ns. Because we had an uneven gender distribution (dysphorics: 72% female, controls: 56% female), we included gender in the model for all analyses reported below. However, a similar pattern of results emerges whether or not gender is included in the models.

We first assessed how appropriate the situations presented in the interpretation bias questionnaire were for this sample. Participants in our study found the vignettes relatively easy to imagine, reporting an overall mean score of 2.17 on our Likert-type scale (a score of 2 corresponded to "easy"). The ten vignettes did not vary much in how easy they were to imagine, with the mean scores per vignette ranging from 1.88 to 2.56. Dysphoric and nondysphoric participants did not differ in how easy they found the vignettes to imagine, F(1, 90) < 1, *ns*,  $\eta_p^2 = .007$ , however a significant interaction between dysphoria status and condition emerged on this variable, F(1, 90) = 11.0, p = .001,  $\eta_p^2 = .109$ . Dysphoric participants found it harder to imagine the vignettes in the friend than the self-condition, F(1, 46) = 12.27, p = .001,  $\eta_p^2 = .218$ , whereas there was no difference between the conditions for the control group, F(1, 48) =1.28, *ns*,  $\eta_p^2 = .027$ . Dysphorics in the self-condition reported a mean rating of 1.9, and dysphorics in the friend condition reported a mean score of 2.5, with a "2" corresponding to "easy" and a "3" corresponding to "not easy or difficult." Therefore, no group reported finding the vignettes difficult to imagine on average.

We next examined the degree to which our "other" manipulation decreased the self-relevance of thinking. Participants in the close friend condition reported that they were thinking of themselves significantly less than participants in the self-condition (Ms = 3.7 and 6.2 respectively), t(91) = 8.98, p < .001, d = 1.85, suggesting that the manipulation was successful in decreasing the self-relevance of interpretations.

#### Interpretation generation

Participants generated an average of 4.04 responses per vignette, indicating that participants were able to imagine multiple interpretations of these situations. The number of interpretations generated did not vary much by vignette, with the mean number generated per vignette ranging from 3.72 to 4.52 responses. There were no main effects of condition or dysphoria status, and no interaction between condition and dysphoria status, on the average number of interpretations generated, Fs < 1, ns,  $\eta_p^2 s < .01$ .

We then examined the effects of dysphoria status and condition on the valence of the interpretations generated (see Table 1). Using

#### Table 1

Study 1: Mean valence of interpretations generated and selected by dysphoria status and condition.

	Interpretation generation										
	Participant ratings				Coder ratings						
	Self	Friend	Average		Self	Friend	Average				
Dysphoric Control Average	-0.72 (0.80) -0.31 (0.77) -0.51 (0.80) Interpretation sel	-0.47 (0.95) -0.01 (0.80) -0.23 (0.90) ection	-0.60 (0.87) -0.16 (0.79)	Dysphoric Control Average	-0.79 (0.42) -0.49 (0.39) -0.64 (0.43)	-0.61 (0.57) -0.37 (0.48) -0.49 (0.53)	-0.70 (0.50) -0.43 (0.43)				
	Participant ratings				Coder ratings						
	Self	Friend	Average		Self	Friend	Average				
Dysphoric Control Average	-0.35 (1.30) 0.50 (1.04) 0.08 (1.24)	0.23 (1.30) 0.92 (0.75) 0.59 (1.09)	-0.08 (1.32) 0.71 (0.92)	Dysphoric Control Average	-0.70 (0.83) 0.02 (0.48) -0.34 (0.76)	$\begin{array}{c} -0.25\ (0.90)\\ 0.14\ (0.71)\\ -0.05\ (0.82)\end{array}$	$-0.49(0.88)\\0.08(0.60)$				

Note. Means are presented with standard deviations in parentheses. The average valence ratings had possible values from -4 to 4, with higher numbers reflecting more positive interpretations.

participants' own ratings of their interpretations, dysphoric participants generated significantly more negative interpretations than controls, F(1, 86) = 6.29, p = .01,  $\eta_p^2 = .068$ , and participants in the self-condition generated significantly more negative interpretations than participants in the friend condition, F(1, 86) = 4.20, p = .04,  $\eta_p^2 = .047$ . No interaction between dysphoria status and condition emerged, F(1, 86) = 0.14, ns,  $\eta_p^2 = .002$ . Using the independent coder ratings, dysphoric participants again generated significantly more negative interpretations than nondysphoric participants, F(1, 86) = 6.69, p = .01,  $\eta_p^2 = .072$ . There was a statistical trend for participants considering themselves to generate more negative interpretations than participants considering their friends, F(1, 86) = 2.79, p = .098,  $\eta_p^2 = .031$ . No interaction emerged between dysphoria status and condition, F(1, 86) = 0.47, ns,  $\eta_p^2 = .005$ .

#### Interpretation selection

One participant neglected to indicate which interpretations she regarded as most likely, and thus her responses could not be included in the selection analyses. Examination of the data revealed one outlying participant whose responses were greater than 2.5 standard deviations below the mean for both participant and coder ratings and this participant's responses were thus excluded from these analyses. Using participants' own ratings, dysphoric participants selected more negative interpretations than controls, F(1,84) = 11.26, p = .001,  $\eta_p^2 = .118$ , and participants in the self-condition selected more negative interpretations than participants in the close friend condition, *F*(1, 84) = 5.76, *p* = .02,  $\eta_p^2$  = .064. No significant interaction emerged between dysphoria status and condition, F(1, 84) = 0.54, ns,  $\eta_p^2 = .006$ . A similar pattern of results emerged for coders' ratings, with dysphoric participants selecting significantly more negative interpretations than controls, F(1, 84) = 11.61, p = .001,  $\eta_p^2 = .121$ , and a statistical trend for participants in the selfcondition to select more negative interpretations than participants in the friend condition, F(1, 84) = 3.17, p = .08,  $\eta_p^2 = .036$ . Again, no significant interaction emerged between dysphoria status and condition, F(1, 84) = 2.69, *ns*,  $\eta_p^2 = .031$ .

#### Effects of making interpretations on state mood

Existing mood differences at time 1, before completing the IBQ, were first examined. As expected, dysphoric participants reported significantly more negative mood than nondysphoric controls at time 1, F(1, 94) = 144.4, p < .001,  $\eta_p^2 = .627$ . We found no main effect of condition, F(1, 94) < 0.01, *ns*,  $\eta_p^2 < .001$ , but did find an unexpected interaction between dysphoria status and condition, indicating a failure of randomization for state-like mood at time 1,  $F(1, 94) = 10.01, p = .002, \eta_p^2 = .104$  (see Fig. 1). Given this existing difference in time 1 mood, we examined changed in mood from time 1 to time 2, rather than simply examining group differences at time 2. To examine change in state-like mood while making interpretations, a repeated measures ANOVA was conducted examining time of mood assessment as a within subjects variable (time 1 = pre interpretation measures, time 2 = post interpretation measures). No significant two-way interactions between time and either dysphoria status or condition emerged, Fs < 2, ns,  $\eta_{\rm P}^2$ s < .025, but there was a significant three-way interaction between time, dysphoria status, and condition, F(1, 85) = 4.08, p = .047,  $\eta_p^2 = .046$ . Follow-up tests revealed no interaction between time and dysphoria status in the close friend condition, F (1, 41) = 0.37, *ns*,  $\eta_p^2 = .009$ , but a significant interaction between time and dysphoria status in the self-condition, F(1, 44) = 4.48, p = .04,  $\eta_p^2 = .092$ . Additional follow-up tests indicated that negative mood increased in the self-condition for dysphorics,  $F(1, 22) = 4.00, p = .06, \eta_p^2 = .154$ , but not for controls, F(1, 22) =0.43, ns,  $\eta_p^2 = .019$ .



**Fig. 1.** Study 1: Effects of dysphoria status and condition on change in mood. Note. Error bars reflect standard errors. Negative mood scores had a possible range of 3–27, with higher numbers reflecting more negative mood.

# Discussion

Dysphoria status and condition significantly affected both interpretation valence and the distress associated with making interpretations. Depressive biases emerged for both generation and selection processes, with dysphoric participants both generating and selecting more negative interpretations than their nondysphoric counterparts. Participants also generated and selected more negative interpretations for themselves than they did for close friends, indicating that both dysphoric and nondysphoric participants were more charitable towards their friends than towards themselves. Interestingly, this effect was found for dysphoric participants despite the fact that they found the vignettes more difficult to imagine when considering friends than when considering themselves. Perhaps, with increased practice at considering friends, dysphoric participants would be able to generate even more positive interpretations than the ones reported in this study.

Both dysphoria status and condition were also related to the distress associated with making interpretations, which we defined as the change in mood from baseline to immediately following the IBQ. Dysphorics in the self-condition reported an increase in negative mood following the interpretation bias measure, with dysphorics in the close friend condition showing no change in mood. Additionally, control participants in neither condition reported a change in mood while making interpretations. Therefore, making interpretations for oneself was distressing for dysphoric but not control participants. This pattern of results is consistent with other research showing that self-reflection exacerbates negative mood for dysphoric but not for nondysphoric individuals (Nolen-Hoeksema et al., 2008), and indicates that making interpretations for others is less emotionally evocative than making self-relevant interpretations for dysphoric individuals. However, it should be noted that that considering others did not actually improve state-like mood, because participants in the closeother condition showed no decrease in negative mood relative to baseline.

Therefore, all participants, whether dysphoric or nondysphoric, generated and selected more negative interpretations for themselves than they did for close friends. Taken together, these results offer support for the therapeutic technique of encouraging depressed clients to consider what they would think if the same situation happened to a close friend as means of changing interpretations. Considering close others will not improve state-like mood immediately, but will encourage the generation and selection of less negatively biased interpretations, one of the primary goals of cognitive therapy for depression.

Of particular interest is the finding that the dysphoric group was still more negative than the nondysphoric group even when making interpretations for their friends. If depressive biases are limited to self-relevant situations, one would expect the dysphoric group to make more negative interpretations than the control group only when considering the self, not when considering close friends. One possible explanation is that friends of dysphoric participants differ from those of controls. For example, friends of dysphoric participants are more likely to be dysphoric themselves (Joiner, 1994; Rosenblatt & Greenberg, 1991). Therefore, the types of situations typically experienced by those friends might be more negative than those experienced by the friends of nondysphoric individuals. Even though considering friends did encourage more positive thinking for dysphoric individuals, the type of friends they considered might not have been effective enough to bring them up to the level of nondysphoric thought. Study 2 addresses this issue by examining a different type of "other" which is standardized across participants and assesses the generalizability of the "close friend" findings to a different kind of "other."

# Study 2

In this study, we again examined interpretation generation and selection in dysphoric and nondysphoric participants. Interpretations made for oneself were compared to interpretations made for a hypothetical other described in neutral terms. Unlike the close friend manipulation used in Study 1, the description of the hypothetical other is standardized across all participants. We chose to describe this individual in neutral rather than positive terms in order to avoid any possible demand characteristics. Although a positive description might be even more effective in eliciting positive interpretations, if we described an individual with positive descriptors, any beneficial effects of other-focus could be explained by participants' expectations about the kinds of interpretations we were looking for, rather than selfrelevance. In this study, we again assessed the valence of interpretations as well as the effects of making self-relevant and other-relevant interpretations on participants' moods.

# Method

#### Participants

Ninety-six participants, recruited from flyers posted around the university campus and in the community, took part in the study and were compensated with a payment of 15 US dollars. Participants reported a mean age of 19.85 years, with ages ranging from 18 to 29. Thirty-eight men (39.6%) and 58 women (60.4%) participated in the study; 42 were (43.8%) White, 26 (27.1%) Asian, 15 (15.6%) Hispanic, seven (7.3%) Multiracial, and six (6.3%) Black or African-American.

#### Materials

The same materials were used as in Study 1, with the following modifications:

Interpretation bias questionnaire. The self-version of the questionnaire was identical to that used in Study 1. The hypothetical other version included a neutral description of an individual ("John" or "Elizabeth") whose gender was matched to the participant's gender, followed by the vignettes written in the third person. The male and female versions of this measure are identical except for the name and the use of either feminine or masculine pronouns. Participants in the hypothetical other condition were asked to form an image of this person in their minds and then to imagine that individual in the situations presented in the questionnaire.

Additional question. We added a question assessing how participants viewed the description of the hypothetical other, to examine whether we were successful in portraying this character in neutral terms. We asked participants in the self-condition to read the description of the gender-matched hypothetical other and to answer the question "What is your initial impression of this individual?" with a response of either positive, neutral, or negative at the beginning of the experimental session. We did not use participants in the hypothetical other condition for this rating, to avoid having the ratings and interpretations made for the hypothetical other influence each other.

#### Procedure

Dysphoric and nondysphoric participants were recruited using the same prescreening procedure as in Study 1, and were randomly assigned to either the "self" or "hypothetical other" condition. Participants again met individually with the experimenter and completed the measures in the same order as in Study 1. We again collected participant and coder ratings of interpretation valence, and the independent coders demonstrated adequate interrater reliability and agreement for positivity (ICC = .91;  $\kappa$  = .80) and negativity ratings (ICC = .92;  $\kappa$  = .82) in this study.

#### Results

Twelve participants reported BDI-II scores at the time of testing that no longer met the cut-offs and were excluded from the analyses. At the time of testing, the dysphoric participants reported BDI-II scores ranging from 16 to 49, with a mean score of 24.9 (SD = 8.8), and 30 (81.1%) reported that their symptoms had lasted for two weeks or longer. Age of participants did not significantly differ by dysphoria status or condition, Fs < 2, ns. As in Study 1, there was an uneven gender distribution (dysphorics, 70% female, controls, 53% female), therefore, we included gender in the model for all analyses reported below, but the pattern of results is similar whether or not we include this covariate. We first assessed the degree to which the description of the hypothetical other was perceived as neutral. Overall, the majority of participants (81.6%) viewed the descriptions as neutral, with 18.4% viewing them as positive and 0% viewing them as negative.

We then examined how easy it was for participants to imagine the situations presented in the interpretation bias questionnaire. Participants again found the scenarios easy to imagine, reporting an overall mean of 2.14 (corresponding to a rating of "easy") across all ten vignettes, with the mean score per vignette ranging from 1.91 to 2.45, which are comparable to those found in Study 1. There were no significant main effects of dysphoria status or condition, and no interaction between these variables, on how easy participants found the vignettes to imagine, Fs < 1, ns,  $\eta_{\rm P}^2$ s < .01. Finally, we assessed the degree to which the hypothetical other manipulation decreased the self-relevance of thinking. We found no significant difference in the degree to which participants in the self and hypothetical other conditions were thinking of themselves while completing the interpretation measure (Ms = 6.04 and 5.60, respectively), t (94) = 1.57, ns, d = 0.32. Because this item was scored on a Likert scale from 1 to 7, with 7 corresponding to "a lot," the mean scores indicate that participants in both groups were considering themselves to a large extent, whether they were instructed to consider themselves or the hypothetical other.

Interpretation generation

The average number of interpretations generated was comparable to Study 1, with an overall mean of 4.08 interpretations per vignette. No main effects or interactions between dysphoria status and condition emerged for the average number of interpretations generated, Fs < 1, ns,  $\eta_p^2$ s < .02. Dysphoric participants generated significantly more negative interpretations than controls according to their own ratings, F(1, 76) = 16.52, p < .001,  $\eta_p^2 = .179$  (see Table 2). A main effect of condition also emerged, F(1, 76) = 5.51, p = .02,  $\eta_p^2 = .068$ . Contrary to predictions, participants in the hypothetical other condition generated significantly more negative interpretations than participants in the self-condition. No interaction emerged between dysphoria status and condition, F(1, 76) =2.13, *ns*,  $\eta_p^2 = .027$ . Using coder ratings, a similar pattern appeared, with significant main effects in the same direction for dysphoria status, F(1, 76) = 19.32, p < .001,  $\eta_p^2 = .203$ , and condition, F(1, 76) = 9.48, p = .003,  $\eta_p^2 = .111$ . Again, no interaction between dysphoria status and condition emerged, F(1, 76) < 0.01, ns,  $\eta_p^2 < .001$ .

#### Interpretation selection

We next assessed the effects of dysphoria status and condition on the valence of the interpretations selected as most likely. Using the participants' ratings, we found that dysphoric participants selected significantly more negative interpretations than controls, *F* (1, 76) = 40.47, p < .001,  $\eta_p^2 = .347$ . A statistical trend for a main effect of condition emerged, F(1, 76) = 3.84, p = .054,  $\eta_p^2 = .048$ , with participants in the hypothetical other condition selecting more negative interpretations than participants in the self-condition. No interaction was present between dysphoria status and condition, *F* (1, 76) = 0.04, *ns*,  $\eta_p^2 < .001$ . According to the coder ratings, there was again a significant main effect of dysphoria status, *F*(1, 76) = 44.50, p < .001,  $\eta_p^2 = .369$ , but no significant effect of condition, *F*(1, 76) = 2.44, *ns*,  $\eta_p^2 = .031$ . Again, no interaction appeared between dysphoria status and condition, *F*(1, 76) = 2.27, *ns*,  $\eta_p^2 = .029$ .

#### Effects of interpretations on state mood

The state mood measure again demonstrated good internal consistency with Cronbach's  $\alpha$ s of .880 at time 1 and .827 at time 2. At time 1, before completing the interpretation measures, the expected difference between dysphoric and nondsyphoric participants emerged, with dysphoric participants reporting more negative mood, *F*(1, 84) = 79.05, *p* < .001,  $\eta_p^2$  = .510. We found no main effect of condition or interaction between dysphoria status and condition on mood at time 1, indicating that our randomization was successful, *Fs* < 1.5, *ns*,  $\eta_p^2$ s < .020. As in Study 1, we then conducted a repeated measures ANOVA examining change in mood from time 1 to time 2 (pre to post interpretation measures). A significant interaction between time of mood assessment and condition

appeared, *F*(1, 76) = 4.83, *p* = .03,  $\eta_p^2$  = .060 (see Fig. 2). Follow-up tests revealed a significant effect of time in the self, *F*(1, 37) = 5.23, *p* = .03,  $\eta_p^2$  = .124, but not the hypothetical other condition, *F*(1, 39) = 0.27, *ns*,  $\eta_p^2$  = .007, with participants in the self-condition reporting an increase in negative mood. No other significant main effects or interactions emerged, *Fs* < 3, *ns*,  $\eta_p^2$  = .04. Although the three-way interaction between time, dysphoria status, and condition was not significant, *F*(1, 76) = 0.75, *ns*,  $\eta_p^2$  = 0.010, we examined the effects of time within the self-condition for dysphorics and controls separately, in order to facilitate comparison with Study 1 results. Similar to Study 1, we found a statistical trend for dysphoric participants in the self-condition to show an increase in negative mood, *F*(1, 17) = 3.53, *p* = .08,  $\eta_p^2$  = 0.172, whereas control participants showed no reliable increase in negative mood, *F*(1, 20) = 1.37, *ns*,  $\eta_p^2$  = 0.064.

#### Discussion

In this study, we replicated the effects of dysphoria status on interpretation valence and examined the effects of self-relevance using a different type of other which was standardized across participants. Dysphoric participants both generated and selected significantly more negative interpretations than nondysphoric individuals. These results offer further support that interpretation generation and selection are both negatively biased in individuals with depressive symptoms and that interpretation generation may be an important focus of therapy.

After changing the type of other person participants were asked to consider in this study, however, we found different effects of selfrelevance. Of primary importance is the fact that participants in the hypothetical other condition were thinking of themselves to a great extent while making interpretations. This finding is consistent with a large body of research indicating that individuals draw upon their own experiences to make inferences for others (Marks & Miller, 1987; Nickerson, 1999). However, this result is inconsistent with Study 1, in which participants in the close friend condition were considering themselves to a lesser extent than participants in the self-condition. One possible explanation for the discrepant findings is the amount of knowledge participants have about different kinds of others. Participants know more about their close friends than hypothetical others described in a brief vignette. Consideration of a highly familiar individual such as a friend may discourage selfreflection because participants can draw upon their memories of the friend in similar situations or their knowledge of the friend's personality, rather than relying upon their own experiences to make interpretations. Gendolla and Wicklund (2009) found that individuals are more likely to assume that another person shares their viewpoints when they have little knowledge about that person.

Table 2

Study 2: Mean valence of interpretations generated and selected by dysphoria status and condition.

	Interpretation generation										
	Participant ratings				Coder ratings						
	Self	Other	Average		Self	Other	Average				
Dysphoric Control Average	-0.80 (0.80) 0.12 (0.86) -0.31 (0.95)	-0.92 (0.67) -0.53 (0.57) -0.69 (0.64)	-0.86 (0.73) -0.22 (0.78)	Dysphoric Control Average	$\begin{array}{c} -0.83\ (0.50)\\ -0.42\ (0.38)\\ -0.61\ (0.48)\end{array}$	-1.05 (0.56)  -0.74 (0.33)  -0.87 (0.46)	-0.94 (0.54) -0.59 (0.39)				
	Participant rating	s			Coder ratings						
	Self	Other	Average		Self	Other	Average				
Dysphoric Control Average	-0.50 (1.14) 1.01 (0.81) 0.31 (1.23)	-0.85 (1.40) 0.58 (1.11) -0.02 (1.42)	-0.67 (1.27) 0.78 (0.99)	Dysphoric Control Average	-0.66 (1.11) 0.22 (0.81) -0.19 (1.05)	-1.06 (1.12) 0.24 (0.66) -0.30 (1.09)	-0.86 (1.12) 0.23 (0.72)				

Note. Means are presented with standard deviations in parentheses. Ratings had possible values from -4 to 4, with higher numbers reflecting more positive interpretations.



**Fig. 2.** Study 2: Effects of dysphoria status and condition on change in mood. Note. Error bars reflect standard errors. Negative mood scores had a possible range of 3–27, with higher numbers reflecting more negative mood.

When given a cue as to the other person's likely attitude, they are less likely to rely upon their own opinions to make predictions about the other person (Gendolla & Wicklund, 2009). The pattern of results across Studies 1 and 2 has important implications for the therapeutic technique of asking depressed clients to consider how they would view others in the same situation. The use of a generic instruction to consider how one would interpret a situation if it happened to "someone else" may not be effective because such an instruction is unlikely to decrease the self-relevance of thinking. Rather, asking participants to consider a close friend would be more likely to discourage self-reflective interpretations.

In Study 2, dysphorics again showed negative biases of equal magnitude for both themselves and a hypothetical other, with no interaction emerging between condition and dysphoria status. This pattern of results is consistent with Study 1, but inconsistent with other findings that dysphoric individuals are more negatively biased for themselves than for others (e.g., Wisco, 2009). The fact that dysphoric individuals were thinking of themselves while completing the hypothetical other version of the measure could explain this finding, because negative self-relevant thinking would be present regardless of condition.

Despite the fact that participants were thinking of themselves to a large extent in both conditions, considering hypothetical others rather than the self had significant main effects upon both interpretation valence and state mood. Asking participants to consider hypothetical others encouraged the generation of even more negative interpretations and yet spared participants from the negative mood effects associated with self-relevant interpretations. These effects were seen both in nondysphoric and dysphoric participants. The finding that consideration of hypothetical others led to more negative interpretation generation was unexpected, but is consistent with social comparison research indicating that individuals are motivated to retrieve negative information about others (Wills, 1981). This motivation is thought to stem from self-esteem preservation, in which individuals profit from favorable social comparisons to less fortunate others. We found no reliable interaction between dysphoria status and condition, suggesting that dysphoric and nondysphoric participants were both motivated to make these downward social comparisons. Interestingly, we found the opposite effect of self-relevance in Study 1, although self-esteem would presumably also profit from favorable comparisons to close friends. Perhaps individuals were less willing to denigrate their friends than a hypothetical person with unflattering interpretations. Alternatively,

consideration of a hypothetical other may have encouraged more abstract, overgeneral thinking than thinking of a specific close friend. Watkins (2008) has found that abstract thinking is associated with depressive symptoms and is generally less adaptive than more concrete thought. If hypothetical others encourage more abstract thinking, this could explain why interpretations are more negative for hypothetical others than for the self or for specific close friends. Again, the results of Studies 1 and 2 suggest that the type of other considered is vitally important to the effectiveness of a common cognitive therapy intervention. Asking therapy clients to consider a generic "someone else" is not likely to help them generate more positive interpretations of a situation, and may in fact backfire, encouraging even more negative interpretations.

Even though participants in the hypothetical other condition generated interpretations that were more negative than those in the self-condition, and selected interpretations that were at least as negative, their mood was not affected by imagining this other person in those situations. In contrast, participants in the selfcondition felt significantly worse after making interpretations. Taken together, these results suggest that considering hypothetical others will not be useful in terms of reducing the negativity of the interpretations generated or selected, but may evoke less of an emotional response than considering oneself in the same situations. The mood effects were somewhat inconsistent across Study 1 and Study 2, with a three-way interaction between time, condition, and dysphoria status emerging in Study 1 but not in Study 2. In Study 1, making interpretations for oneself led to worsened mood in dysphorics but not controls. In Study 2, making interpretations for oneself led to worsened mood overall, and this effect was not qualified by an interaction with dysphoria status. However, Study 2 follow-up tests indicated that the effect of making interpretations for oneself was larger in the dysphoric than the control group  $(\eta_{\rm p}^2 {\rm s} = 0.172 \text{ and } 0.064 \text{ respectively})$ , which is broadly consistent with the pattern of results in Study 1. In both studies, making interpretations for others did not lead to any change in mood. Therefore, both studies suggested that dysphoric participants experience more negative mood after making interpretations for themselves but not for others. These findings suggest that making interpretations for either familiar or unfamiliar others, rather than for oneself, can be useful in terms of evoking less of an emotional response in dysphoric individuals.

It should be noted that considering others did not lead to a decrease in negative mood from baseline for any group. Considering others is therefore only adaptive in comparison to considering oneself for the dysphoric group. However, we argue that this relative difference is meaningful given the importance of discussing interpretations in cognitive therapy. Because focusing on selfrelevant interpretations leads to even more negative mood, depressed clients may be reluctant to maintain a focus on these interpretations. Considering close or hypothetical others offers a potential way to retain a focus on interpretations while decreasing the emotional salience of the discussion, possibly encouraging greater engagement with the exercise.

# Overall discussion

Interpretations of ambiguous situations are negatively biased in individuals with depressive symptoms. To our knowledge, these studies are the first to examine the generation of multiple interpretations for a single situation, and our findings indicate that depressive symptoms are related to negative biases in interpretation generation as well as selection. Our results suggest that dysphoric individuals could benefit both from therapeutic strategies designed to increase generation of less negative interpretations and from strategies designed to examine how likely or realistic their interpretations are. Measures such as the one created for this study could also be developed as idiographic assessment tools to help determine whether interpretation generation or selection is the most appropriate target of cognitive interventions for particular individuals.

Our results indicate that the type of "other" used is critically important when attempting to modify interpretation valence. When asking a therapy client to consider what s/he would think if the same situation happened to someone else, specifying a particular close friend is likely to be effective in encouraging more positive interpretations. However, generic instructions to consider what one would think if the same thing happened to "someone else" are not likely to reduce negativity and may backfire. The type of other considered may be important for a number of reasons. As discussed above, consideration of a specific close friend may decrease the self-relevance of thinking more than consideration of a hypothetical others, thus allowing for more positive interpretations. Thinking of hypothetical others may be more likely to lead to downward social comparisons or to more abstract thinking, both of which would be expected to encourage more negative interpretations. Interestingly, making interpretations for any type of other, whether close or hypothetical, is less emotionally evocative than making interpretations for oneself, at least for dysphoric individuals. Instructions to think about generic others could be useful in terms of reducing emotional reactions to potentially negative situations in dysphoric individuals. Consideration of hypothetical others could be particularly useful for depressed clients who are socially isolated and may have trouble thinking of a close friend.

Limitations of this study include our use of a self-report interpretation bias questionnaire. Self-report measures have been criticized because individuals may have little insight into their own cognitive processes and because they can be influenced by response biases (Nisbett & Wilson, 1977). Still, a benefit of these measures is that interpretations are solicited in a manner similar to the therapeutic setting, which requires clients to report their interpretations to the therapist. Another limitation is the use of a dysphoric analogue sample. While these studies offer useful information regarding the relationship between depressive symptoms and both the process of interpretation generation and the role of self-relevance in interpretation biases, it would be useful to replicate these effects in a sample of clinically depressed participants to ensure the generalizeability of our findings. We note, however, that our dysphoric samples had mean BDI-II scores of 24, in the moderate symptom range. A potential limitation of Study 1 is the failure of randomization of state-like mood, with dysphorics in the self-condition reporting less negative mood than dysphorics in the friend condition at time 1. We addressed this limitation by using a repeated measures ANOVA to examine change in mood from time 1 to time 2, thus taking baseline mood differences into account. However, it would be useful to replicate these results to ensure their robustness in the presence of higher levels of baseline negative mood in the self-condition. Additionally, we asked participants to imagine hypothetical situations, rather than situations that had actually happened to them. We chose hypothetical situations in order to avoid confounding interpretation bias with memory bias, and we took pains to choose ecologically valid vignettes that are representative of real-world situations. However, it will be important to examine whether similar effects are found when clients consider situations that have actually happened. Finally, we did not assess the degree to which participants engaged in mental imagery versus verbal processing while completing the IBQ. Although the IBQ presents situations verbally and asks for verbal responses, participants may have spontaneously engaged in mental imagery while completing the measure. The extent to which participants engage mental imagery versus verbal processing may change the kinds of interpretations that they make, and would be an interesting topic of future research. Strengths of our studies include the examination of both interpretation generation and selection, inclusion of both the participants' own and independent coder ratings of valence, the comparison of two kinds of "other," and the assessment of both interpretation valence and state mood effects.

These studies have potential implications for the implementation of cognitive therapy for depression. Because depressive biases exist for interpretation generation as well as selection, helping depressed clients generate more positive alternatives may be a useful therapeutic intervention. When encouraging the selection of more positive interpretations, asking depressed clients to consider a close friend is likely to be beneficial, but generic instructions to imagine what one would think if the same situation happened to "someone else" are not likely to be helpful. Considering either type of "other," however, decreases the distress associated with making interpretations for potentially negative situations. More generally, these studies speak to the important role of self-relevance in the assessment of depressive biases in cognition, and the potential utility of lab-based experimental research in the examination of short-term effects of therapeutic techniques.

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#### Appendix. Interpretation bias questionnaire

The following vignettes were presented to participants in the order seen below. In the version given to participants, each vignette was presented on a separate page, with lines on which participants could write their responses. The vignettes and instructions provided below are from the "self" version. The close friend and hypothetical other versions were identical except that the instructions were modified to refer to the appropriate "other" and the vignettes were written in the third person.

Instructions (self-version): Please read each of the following vignettes and imagine that they happened to you. Answer the question at the end of the vignette with any explanations that would come to mind if you were in that situation. Please write down your answers *in the order that you think of them*. Please begin each new response on a separate line, and begin each new response with a dash (–). After listing the explanations that come to mind, please circle the dash (–) next to the answer that you would think is the most likely explanation for the situation. First you're going to do a practice vignette, which the experimenter will discuss with you. Then you'll complete the rest of the vignettes on your own.

Practice. You check your voicemail, and you have two messages from earlier that day. Both are from your parents. Your parents don't say much in the messages, just to call them back as soon as you get the message. Why are they trying to reach you?

- 1. It's your second week on the job. Your boss stops by your desk in the early afternoon and asks you to come to his office later that day. Why does your boss want to see you?
- 2. You're walking down the street, and you see one of your friends coming the other way with a group of people. You wave, but your friend doesn't respond. Why?
- You go on a blind date that was arranged by one of your friends. You go out to dinner and a movie. After the movie, your date

suggests going out for dessert, so you stay out a little longer. At the end of the evening, your date asks for your phone number and promises to call. Two days later, you haven't received a call. Why?

- 4. You are applying for a summer internship, and the application requires a letter of recommendation. You email one of your professors to see if they would be willing to write one for you. When you don't hear back after one week, you email the professor again. Why hasn't the professor responded to your request?
- 5. You are having a conversation with one of your friends. Your friend mentions a party that a mutual acquaintance is throwing next week. This is the first you've heard about the party. Why?
- 6. You're giving a speech. People in the audience start laughing. Why?
- 7. You call a good friend of yours and leave a message suggesting getting together later in the week. A few days pass, and you haven't heard from them. Why haven't they returned your call?
- 8. You're taking the final exam for one of your classes. About halfway through the allotted time, you notice that a few students are already turning in their exams and leaving. You look down at your exam and notice that you are halfway through the questions. Why are you taking longer than those students?
- 9. Your significant other leaves you a voicemail saying "Hi it's me. Give me a call." What does he/she want to talk to you about?
- 10. You are part of a close-knit group of friends. You used to all hang out as a group, but lately two of your friends have been spending a lot of time together without the rest of the group. What's going on?

Note. A formatted version of the IBQ is available from the corresponding author upon request.

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