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Attributions for Relatives' Behavior and Perceived Criticism: Studies With Community Participants and Patients With Anxiety Disorders

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Abstract

The relationship between perceived criticism from one's relative and attributions about that relative's behavior was examined in two studies. In Study 1, 50 community couples volunteered to participate in a study of marital interaction. Participants rated their interaction-specific perceived criticism after a 10-min problem-solving interaction and their attributions for their spouses' behavior during a review of the videotaped interaction. In Study 2, 70 outpatients with obsessive-compulsive disorder ($n = 41$) or panic disorder with agoraphobia ($n = 29$) completed a measure of global perceived criticism in their relationship with their spouse or other family member and on another occasion participated in a 10-min problem-solving interaction with that relative. Using interaction transcripts, coders extracted and coded attributions from patients' speech and, using the videotapes themselves, rated relatives' observable criticism. In both studies higher scores on negative attributions were related to higher perceived criticism ratings. In Study 2, negative attributions contributed to the prediction of perceived criticism above and beyond the contribution of observed criticism. These findings suggest that targeting attributions about perceived criticism may be fruitful in reducing the negative impact of perceived criticism on treatment outcome for a variety of psychiatric disorders.

Perceived criticism from a spouse, romantic partner, or other relative with whom one resides has proved to be an important predictor of initial treatment response for obsessive-compulsive disorder and panic disorder with agoraphobia (Chambless & Steketee, 1999), of relapse after hospitalization for major depression (Hooley & Teasdale, 1989; Kwon, Lee, Lee, & Bifulco, 2006), of relapse among patients treated for substance abuse (Fals-Stewart, O'Farrell, & Hooley, 2001), and of increases in symptoms of depression over time in undergraduates (Renshaw, 2007). Drawing from the substantial literature on expressed emotion (especially criticism and hostility) as predictors of treatment outcomes for a variety of psychiatric disorders (see Butzlaff & Hooley, 1998, for a review), Hooley developed the

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Perceived Criticism Measure (Hooley & Teasdale, 1989), which provides a single-item rating scale of how criticized people perceive themselves to be by a significant other. Traditionally, expressed emotion (EE) is assessed by the Camberwell Family Interview (CFI; Vaughn & Leff, 1976), a lengthy and laboriously coded interview about the patient conducted with the relative in the patient's absence. In two investigations to date, the single perceived criticism rating was a better predictor of initial treatment outcome for anxiety disorders or post-hospitalization relapse for major depression than were the CFI measures of EE (Chambless & Steketee, 1999; Hooley & Teasdale, 1989). Given these results, the importance of understanding the factors that contribute to perceived criticism and the mechanisms by which perceived criticism might be related to treatment outcome is apparent. Here the literature on predictors of EE may provide a guide.

A burgeoning literature on attributions and EE has illuminated the relationship between relatives' attributions about patients' negative behaviors or negative events in the patients' lives and relatives' tendency to be hostile or critical during the CFI. This research draws from Weiner's (1986) theory of attribution, which proposed that attributions are critical components in one's emotional and behavioral reactions to events, and from a substantial literature on the importance of attributional processes to marital interaction (see review by Bradbury & Fincham, 1990). This analysis suggests that once having determined that an event (e.g., a patient's or spouse's behavior) is negative, one's response will be shaped by one's assessment of the causes of that event. For example, the spouse of a patient with obsessive-compulsive disorder may be unhappy about the patient's failure to complete his or her share of the household chores in any event. However, the spouse is likely to be considerably more irked if he or she believes the patient could readily complete the chores but chooses not to do so out of laziness or indifference than if the spouse believes the patient's failure results from overwhelming fear of contamination.

Based on their narrative review of 11 studies of attributions and EE, Barrowclough and Hooley (2003) concluded that relatives were more likely to be critical and hostile when they viewed negative behaviors or events as under the patients' control. In addition, criticism and hostility were related to attributions that the negative behaviors or events were due to stable causes, causes internal to the patient, and causes that were personal to the patient rather than typical of those in the patient's reference group (e.g., those with his or her disorder). Most of this research was conducted with patients with schizophrenia and their families, but the findings extended to patients with major depression and bipolar disorder as well. Subsequent to this review, the results of three studies have demonstrated the relationship between relatives' attributions and their criticism of and/or hostility toward patients with anxiety disorders (Barrowclough, Gregg, & Tarrier, 2008; Renshaw, Chambless, & Steketee, 2006; van Noppen & Steketee, 2009). The research to date speaks to the relationship of the relatives' attributions about the patient to the relatives' hostility or criticism. But what of the attributions made by the recipient of the criticism about the relatives' behavior? These have not been the subject of scrutiny and have the potential to increase our understanding of perceived criticism.

Hooley and Teasdale (1989) proposed that perceived criticism reflects how much of the relative's criticism is getting through to the patient. It is also possible that patients may perceive criticism when none was intended or when observers would not agree that a statement was critical, a phenomenon Smith and Peterson (2008) have labeled *criticality bias*. In both cases, an understanding of the attributions patients make for relatives' behavior may be important. Recent work by Renshaw, Blais, and Caska (in press) demonstrated that ratings of perceived criticism reflect the respondent's view that the relative criticizes him or her in a destructive rather than constructive fashion. The patient who tends to draw more negative attributions about the relative's behavior or events in the relative's life (e.g., that

the relative intended to be hurtful or that the event stems from a negative and stable character trait of the relative) may be more likely to interpret the relative's behavior toward himself or herself as destructive criticism. Indeed, Peterson, Smith, and Windle (2009) found a self-report questionnaire assessing spouses' attributions for their partners' negative behaviors in general was correlated to criticality bias scores obtained from a subsequent laboratory interaction between spouses. Moreover, perceived criticism is significantly and negatively correlated with marital adjustment (Chambless & Blake, 2009; Smith & Peterson, 2008) and marital adjustment is predicted both concurrently and longitudinally by negative attributions (Bradbury & Fincham, 1990; Fincham, Bradbury, Arias, Byrne, & Karney, 1997). Both attribution theory and a scant amount of empirical data thus suggest that a better understanding of the relationship of attributions about relatives' behavior may prove fruitful in elucidating the nature of perceived criticism. This is the goal of the present investigation.

Understanding contributors to perceived criticism may point to possible treatment interventions targeting this important predictor of treatment outcome. We investigate the relationship between patients' attributions and perceived criticism in two samples—a community sample of couples and a sample of outpatients with anxiety disorders and their relatives—and use two different methodologies to determine the robustness of the obtained relationship across multiple operationalizations of the attribution construct. We hypothesized that participants who more strongly (Study 1) or more frequently (Study 2) endorsed negative attributions about their relatives' behavior during a problem-solving interaction would be more likely to perceive their relatives as critical of them than would those who made fewer negative attributions or endorsed a weaker belief in these attributions. In addition, drawing from Peterson et al. (2009), we expected attributions would uniquely contribute to the prediction of perceived criticism above and beyond the contribution of criticism as rated by observers.

Study 1

METHOD

Participants—Fifty married couples were recruited from the Chapel Hill, NC ($n = 26$) or the Seattle, WA ($n = 24$) metropolitan area via flyers and newspaper advertisements.¹ Participants averaged 38.1 years of age ($SD = 12.6$) and had been married an average of 9.3 years ($SD = 11.9$). On the whole, these participants were European American (91%), highly educated ($M = 17.8$ years, $SD = 2.7$), well adjusted ($M = 51.77$ on the Brief Symptom Inventory-Global Severity Index, $SD = 9.45$), and satisfied in their marriages ($M = 111.59$ on the Dyadic Adjustment Scale, $SD = 15.23$). Only 8% percent of women and 18% of men had a Brief Symptom Inventory-Global Severity Index T score above 63, suggesting caseness (the presence of clinically significant symptoms). On the Dyadic Adjustment Scale, only 8% percent of the women and 14% of men scored below the cutoff score of 98 (Jacobson, Schmaling, & Holtzworth-Munroe, 1987), reflecting marital distress. For additional demographic details on this sample, see Chambless and Blake (2009).

Incentives to participate included entry into drawings for two \$50 gift certificates to local restaurants and feedback about their relationship. This research was conducted under the oversight of the institutional review boards of the University of Washington and the University of North Carolina at Chapel Hill.

¹In Study 1 of Chambless and Blake (2009), we report on the convergent and discriminant validity of the Perceived Criticism Measure using additional data gathered from these participants.

Measures

Demographic Information Sheet: The demographic information sheet consisted of questions ascertaining age, income, education, race, number of people in the home, number of years married, and so forth.

Dyadic Adjustment Scale (DAS; Spanier, 1976): The DAS is the most widely used self-report measure of marital satisfaction (Snyder, Heyman, & Haynes, 2005). Scores on this 32-item scale range from 0 to 151, with scores below 98 commonly taken to indicate relationship distress (see Jacobson et al., 1987). The DAS has been shown to have good test-retest reliability and internal consistency (Carey, Spector, Lantinga, & Krauss, 1993) and convergent validity with self-report and interviewer measures of marital adjustment (Heyman, Feldbau-Kohn, Ehrensaft, Langhinrichsen-Rohling, & O'Leary, 2001; Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito, 1995).

Brief Symptom Inventory (BSI; Derogatis, 1992): The BSI is a widely used 53-item self-report measure of current psychological distress. Items are designed to tap nine symptom dimensions (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) and are averaged to create the raw scores of the Global Severity Index. Used in T score form, this index is the most sensitive of the BSI overall indices to psychological distress. It is highly internally consistent and very stable across time, with coefficients of .90 in each case (Derogatis, 1992). The Global Severity Index has demonstrated good convergent validity with interviewer ratings of psychiatric symptoms (Morlan & Tan, 1998).

Perceived Criticism Measure (Hooley & Teasdale, 1989): Perceived criticism is assessed by the question "How critical is your spouse of you?" Responses on a 10-point Likert-type scale range from 1 (*not at all critical*) to 10 (*very critical indeed*). Test-retest reliability coefficients of .75 were obtained in two samples over a 2-week (Chambless & Steketee, 1999) or 20-week period (Hooley & Teasdale, 1989). Overall, perceived criticism from spouses and other relatives has shown reasonably good discriminant validity with measures of psychopathology (see review by Renshaw, 2008). Perceived criticism has demonstrated good convergent validity with spouses' and other relatives' own reports of how critical they are of the respondent (Chambless et al., 1999; Chambless & Blake, 2009), untrained coders' ratings of the extent of spouses' observed criticism during a problem-solving interaction (Chambless & Blake, 2009; Smith & Peterson, 2008), and marital dissatisfaction (Chambless & Blake, 2009; Smith & Peterson, 2008). Participants in construct validity studies have included clinical and community samples. For the purposes of this investigation, not only was the standard Perceived Criticism Measure used (called hereafter *Global Perceived Criticism*) but also an interaction-specific version was developed to assess the degree to which participants thought they had been criticized by their spouses in an immediately preceding 10-min problem-solving interaction (hereafter *Interaction-Specific Perceived Criticism*). The wording of the anchors for the latter was identical to that of the Global Perceived Criticism measure, but participants were asked, "How critical was your spouse of you during the interaction that you just completed?"

Attributions assessment: Subsequent to the problem-solving interaction, each participant viewed a videotape of the interaction (see Procedure). At 2-min intervals, the tape was halted, and participants were asked to rate the extent to which they concurred with 11 statements of attributions for a total of 5 ratings per attribution. The 11 attributions were drawn from the literature on marital distress and attributions and included unstable/stable, specific/global, internal/external (self), internal/external (partner), state/trait, intentional/unintentional, partner intended to have a negative impact, partner deserves to be blamed for

impact on participant's feelings, and partner acted out of selfish reasons. Of particular interest to the current study was the relationship between perceived criticism and negative attributions because these have been implicated in the EE literature. Therefore, only the questions related to intention to have a negative impact, blameworthiness, and selfishness were used in analyses. The remaining attribution ratings could not be categorized as positive or negative because their context was unknown. For example, if a participant rated her or his spouse's behavior as due to global and stable causes, this would be positive if the behavior was positive but negative if the behavior was negative. Because our method did not permit us to determine whether the behavior for which the attribution ratings were made was positive or negative, these attributions were eliminated from further consideration.

Participants were asked to rate their beliefs on Likert-type scales ranging from 1 to 6. These questions asked: (a) "To what extent do you believe he/she intended to have a *negative impact* on your feelings as compared to *not* intending to have a *negative impact* at all? My partner's intent was ..." (1 = *not negative at all*, 6 = *totally negative*); (b) "Given that something about your partner or something your partner did during this interaction had an impact on your feelings, to what extent do you believe he/she deserves to be *blamed* for his/her behavior?" (1 = *not at all blamed*, 6 = *totally blamed*); (c) "To what extent do you believe that your partner's behavior during this interaction was due to *selfish reasons* as compared to *unselfish reasons*?" (1 = *not at all selfish reasons*, 6 = *totally selfish reasons*). The assessment ratings were averaged across the five administrations to yield scores for each of the attributions of interest.

Procedure—Couples interested in participating in the study were initially interviewed via telephone. Individuals who were psychotic or actively suicidal were excluded from the study. Screening questions for these exclusion criteria were adapted from the Structured Clinical Interview for DSM III-R (SCID; Spitzer, Williams, Gibbon, & First, 1989). In addition, by request of the University of Washington Human Subjects Approval Committee, the 24 couples from Seattle were interviewed according to the Conflict Tactics Scale (Straus, 1979) to exclude domestic violence.

Each spouse was mailed a packet of questionnaires to complete independently, although we cannot verify that they did not share their responses. This packet contained a consent form, a demographic information sheet, the Dyadic Adjustment Scale, the Brief Symptom Inventory, and the Global Perceived Criticism Measure.

When the participants arrived for the interaction and interview, a second consent form was reviewed and signed. Each couple discussed an agreed-upon relationship problem for a 10-min videotaped session. Immediately after the interaction, each participant independently completed the Interaction-Specific Perceived Criticism Measure.

Spouses were separated and met individually with a research assistant who took them through a review of the videotape of their problem-solving interaction. At 2-min intervals, the videotape was stopped, and participants were asked a series of open-ended questions about their thoughts, feelings, and beliefs regarding their spouses' behaviors and intentions during the preceding interaction segment. The protocol was a modified version of the Semi-Structured Articulated Thoughts Procedure (Vivian, Langhinrichsen-Rohling, & Ayerle, 1995). Participants then provided the attributions ratings. The interview was included for unpublished exploratory research, and its data are not used in the current investigation. Interviews and questionnaires were repeated at each 2-min interval, for a total of five times per participant.

Participants were fully debriefed upon completion of the study. No couple reported significant distress resulting from the interaction.

RESULTS

To reduce Type I error from multiple tests and to create a variable with a more normal distribution than the separate attribution scales, the three negative attribution ratings were averaged to create an overall negative attributions score. Internal consistency was acceptable for men (Cronbach's $\alpha = .72$) although lower than desirable for women (.57). All item-remainder correlations for the women's data were $>.3$, and internal consistency could not be improved by deleting any of the items. Accordingly, the 3-item score was retained. With alpha set at .05 (two-tailed), and a sample size of 50 per analysis, power was estimated at .83 for a medium correlation of .40.

Descriptive data are provided in Table 1. On average participants perceived fairly low levels of criticism in their relationships in general and during the problem-solving interaction in particular and indicated they did not hold negative attributions for their spouses' behavior during the interaction. As indicated by Wilcoxon signed ranks test, husbands and wives did not differ significantly on global perceived criticism. However, wives rated their belief in negative attributions for their husbands' behavior more strongly than the converse, and husbands rated their wives as more highly critical of them during the interaction than wives rated husbands as having been critical of them.

Attributions and Perceived Criticism—In light of the skewed data, nonparametric correlations (Spearman's r_s) were calculated between the averaged beliefs in negative attributions and Interaction-Specific Perceived Criticism. As predicted, higher ratings on negative attributions were positively correlated with higher Interaction-Specific Perceived Criticism ratings.² See Table 2.

Because the sample was drawn from two different states, it was desirable to check whether the correlations held true for both states. Multiple regression analyses to conduct tests of the interaction of State \times Attributions in prediction of perceived criticism were inadvisable because regression diagnostics indicated violations of the assumptions of multiple regression. Accordingly, Spearman's r_s was computed separately for each sample. In both states the correlations of attributions to perceived criticism were positive and significant. For wives, $r_s = .38$ ($p = .007$) for NC and $.57$ ($p = .004$) in WA, whereas for husbands $r_s = .35$ ($p = .014$) for NC and $.59$ ($p = .002$) for WA.

Because Global Perceived Criticism proved to be correlated with the DAS in this sample, at least for wives (Chambless & Blake, 2009) it was possible that the relationships obtained between perceived criticism and negative attributions could be attributed to their shared variance with marital adjustment. The low and nonsignificant correlations between Interaction-Specific Perceived Criticism and the DAS in Table 2 suggest this is unlikely. Nonetheless, multiple regression equations were conducted for husbands' and wives' data with Interaction-Specific Perceived Criticism as the dependent variable and the DAS and negative attributions ratings as the independent variables. Examination of measures of excessively influential data points, residual plots, and collinearity diagnostics indicated that the assumptions of multiple regression were met. For wives' data, once the contribution of marital adjustment was controlled, attributions continued to be a significant predictor of

²Given that internal consistency for wives' attribution ratings was lower than desirable, analyses were run for each attribution rating separately. Consistent with the results of the summary score, correlations between negative attributions and perceived criticism were positive for each of the attribution ratings, although not statistically significant in the case of blameworthy ($r_s = .43$, $p = .003$ for selfish; $r_s = .39$, $p = .007$ for intentional negative impact; and $r_s = .13$, $p = .38$ for blameworthy).

Interaction-Specific Perceived Criticism (semi-partial $r[sr] = .38, p = .008$). Similarly, husbands' negative attributions contributed uniquely to the variance in their Interaction-Specific Perceived Criticism scores ($sr = .32, p = .03$) with marital adjustment controlled.

DISCUSSION

Consistent with hypothesis, both husbands and wives who indicated they more strongly believed their partners to have intended to have a negative impact on them and to have behaved selfishly and in a blameworthy fashion during a problem-solving interaction were more likely to perceive their partners to have been critical of them than those who reported weaker beliefs in negative attributions. It is striking that these findings emerged despite considerable restriction of range: Few spouses in this happily married sample had more than minimal beliefs in negative attributions, and rates of perceived criticism were low.

In future research it would be desirable to determine whether attributions account for variance in perceived criticism above and beyond that contributed by observers' ratings of the spouse's criticism. This was not possible to undertake in the present investigation.³ In addition, our investigation of the contribution of attributions was limited because our methodology made it impossible to determine whether many attributions studied in the marital distress literature (e.g., stable, global, personal) were attributions for negative rather than for positive or neutral behaviors and thus might contribute to perceived criticism. Although we obtained ratings of stability, etc., these were not tied to an identifiable behavior that could be classified as to its negativity. Inclusion of these additional attribution ratings would have yielded a broader measure of attributions and might have strengthened the relationship of negative attributions to perceived criticism.

Next, it is conceivable that the method of obtaining attribution ratings in this investigation may have shaped their expression. Participants provided ratings of the extent of their belief in a variety of attributional statements on five occasions, each time after a brief elicitation of their recollection of their thoughts and feelings about their spouses' behavior during a specific 2-min chunk of the problem-solving interaction they had just reviewed. Thus, it could be argued that the attributions reported did not spontaneously occur during the problem-solving interaction itself but were later prompted by the assessment process (Barrowclough & Hooley, 2003). Moreover, that perceived criticism and attributions were obtained via self-report questionnaires from the same respondent risks inflating the obtained correlation by shared method variance (Bradbury & Fincham, 1990). Thus, it would be highly desirable to conduct research on spontaneously expressed attributional statements during interactions, such as has been done in two studies of expressed emotion and attributions (Renshaw et al., 2006; Wendel, Miklowitz, Richards, & George, 2000). Also, it would have been desirable to have each couple engage in two interactions, one selected by the wife and the other by the husband, instead of using one topic jointly selected. Heavey, Layne, and Christensen (1993) found somewhat different patterns of behavior for wives' topics versus husbands' topics. In this case we deemed the subject burden of discussing and reviewing two topics to be prohibitive.

An additional limitation to the present study is the nature of the sample. Participants were largely European American, highly educated, well adjusted, and happily married. We expect that the relationships observed in the present study would, if anything, be stronger in a more psychologically or maritally distressed sample. However, additional studies are required to determine whether these data would generalize well to couples from other racial and ethnic groups and from other educational backgrounds.

³Sadly, the videotapes were lost before they could be coded.

Study 2

The second study permits us to address a number of the limitations of Study 1. Here we used a clinical and more demographically diverse sample: Participants in this study were outpatients with panic disorder with agoraphobia (PDA) or obsessive-compulsive disorder (OCD) and the closest relative with whom they lived, typically a spouse. Attributions in this study were not elicited by researchers and rated by participants. Rather, attributions were extracted from archived transcripts of patients' speech during problem-solving interactions with their spouses or other relatives, permitting computation of multi-method correlations of perceived criticism with attributional measures. Finally, we were able to obtain observers' ratings of relatives' criticism during the problem-solving interactions for this study.

We examined the three types of attributions that have been most commonly studied in EE research: patients' attributions that events in relatives' lives (behaviors, experiences, or situations) were caused by forces *internal* to the relative, were *controllable* by the relative without extraordinary effort on the relative's part, and were *personal* to this relative rather than common among people in the relatives' reference group. In addition, because it has been suggested that *responsibility attributions*, defined in the EE literature as attributions that are simultaneously coded as internal, personal, and controllable, may be particularly important in the prediction of EE (Barrowclough, Johnston, & Tarrier, 1994), we examined this additional category. In EE research the focus has been on attributions for negative events in patients' lives or negative behavior on the patients' part. It seemed possible to us that attributions for positive events in relatives' lives or positive behavior on the relatives' part might be related to patients' perceptions of criticism. For example, perceived criticism might be lower if the patient viewed an act of kindness on the relative's part to be due to causes that were internal to the relative and under the relative's control. Accordingly, we examined attributions for both relatives' positive and negative behaviors and events.

Unlike in Study 1, we did not have ratings of Interaction-Specific Perceived Criticism. Rather, we predicted patients' attributions for relatives' negative behaviors and events during the problem-solving interaction would be correlated with Global Perceived Criticism and expected that the size of the correlation would be attenuated by the lack of a match in the time frame for rating perceived criticism and uttering attributional statements. Indeed, this proved to be the case in the Study 1 sample where correlations between Interaction-Specific Perceived Criticism and attributions were higher in both husbands and wives than the correlations of attributions with Global Perceived Criticism (see Table 2). In addition, we predicted attributions would account for a unique proportion of the variance in perceived criticism scores when analyzed in conjunction with observed criticism.

METHOD

Participants—The sample was drawn from 104 outpatients with either OCD ($n = 62$) or PDA ($n = 42$) and cohabitating family members who participated in a behavior therapy study in Washington, DC, or Boston, MA (see Chambless & Steketee, 1999). Patients met criteria for a primary diagnosis of OCD or PDA according to the Structured Clinical Interview for the DSM-III-R (Spitzer et al., 1989) and received free or low-cost individual behavior therapy in exchange for their and their relatives' participation in research. Seventy patient-relative dyads (PDA $n = 29$; OCD $n = 41$) with transcripts of 10-min problem-solving interactions were included in the present study.⁴ The quality of the recordings for the remaining patients was too low to permit transcripts, or the tapes were missing or had

⁴Renshaw et al. (2006) reported the results of a study investigating the relationship of relatives' attributions for patients' negative behaviors and events to EE in this same sample.

been inadvertently destroyed. When compared on biographical and family variables, dyads without transcripts did not differ significantly from the current sample on patients' diagnosis, age, perceived criticism, or (when patients lived with a spouse or partner) patients' report of marital adjustment. Similarly, these dyads did not differ on relative's age, type, sex, or (for spouses) report of marital adjustment (all p s > .2). However, dyads without transcripts more often included a male patient (44% of excluded dyads versus 19% of included dyads, $\chi^2(1, N = 104) = 7.6, p < .001$).

Patients averaged 34.79 years in age ($SD = 9.29$) and reported a mean symptom duration of 12.5 years ($SD = 10$; range 1 to 54 years). Ethnic/racial distribution was 86% White, 11% African American, and 3% other. Most (81%) were female, and 79% were married or cohabiting with an intimate partner. Patients ranged in educational attainment from failing to complete high school to holding a doctorate or other advanced degree. On average they had completed some college, $M = 5.11, SD = 1.03$ on the Hollingshead 1–7 scale (Hollingshead, 1975).

Selection of a primary relative: To avoid introducing dependency in the data, when patients lived with more than one relative ($n = 15$), only data from one relative per family were used for analyses. Spouses/partners were selected over parents, who in turn were selected over other relatives. To be consistent with the body of EE research, when the patient lived with two parents, the parent higher in criticism on the CFI was selected. Included relatives had a mean age of 40.54 years ($SD = 12.51$), and 71% were men. Of the non-spousal relatives, 11 were parents; the remaining 3 were an adult child, a sibling, and a niece.

Measures

Structured Clinical Interview for the DSM-III-R (SCID-III-R)–Patient Version: The SCID-III-R (Spitzer et al., 1989) was used by trained graduate students to diagnose patients. Chambless and Steketee (1999) reported excellent interrater reliability for diagnoses of OCD ($\kappa = 1.0$) and PDA ($\kappa = .94$).

Perceived Criticism Measure (PCM): The Global PCM as described for Study 1 was used in this investigation because no interaction-specific measures of perceived criticism were collected. This Global Perceived Criticism measure was moderately and significantly correlated with Interaction-Specific Perceived Criticism in the Study 1 sample (see Table 2). Accordingly, Global Perceived Criticism was used as a proxy for Interaction-Specific Perceived Criticism in Study 2.

Leeds Attributional Coding System: The Leeds Attributional Coding System (LACS; Stratton et al., 1986; Stratton, Munton, Hanks, Heard, & Davidson, 1988) was used to extract and code attributional statements made by patients during the problem discussion with their primary relative. An attributional statement is defined as a statement that expresses, explicitly or implicitly, a causal belief about an *event*. Events are defined as (a) a relative's behavior, (b) an experience the relative has had, or (c) a situation in which the relative finds himself/herself). A graduate student and 2 undergraduate research assistants extracted patients' attributions for positive and negative events in the relatives' lives. All coders were uninformed as to patients' perceived criticism scores. Coders were trained in the LACS by the first author. They read the LACS manual along with training materials developed by Christopher Brewin, Christine Barrowclough, and Deborah Licht and practiced extraction and coding using standard training materials developed by Christine Barrowclough. Subsequently, they extracted and scored attributions from transcripts not included in the present sample before beginning coding for this study.

Extracted statements were categorized by each research assistant on the three dimensions most commonly used in EE research: internal/external, controllable/uncontrollable, and personal/universal. Information from the entire transcript was used to inform the coding of each statement. Separately for each dimension, a proportion score was calculated by dividing the total number of statements coded 1 (internal, controllable, or personal) by the total number of statements coded either 1 or 0 (external, uncontrollable, or universal). Mixed attributions (e.g., statements including internal and external elements) are omitted from the calculation. Statements that were coded as internal, controllable, and personal were labeled responsibility attributions (Barrowclough et al., 1994; Hooley & Licht, 1997). For example, the statement “You don’t look at me when I speak to you. What I have to say isn’t worthwhile to you,” was coded as simultaneously internal, personal, and controllable and therefore constituted a responsibility attribution. The assistants also indicated whether each statement was related to the patient’s illness.

Interrater reliability assessed using a generalized kappa statistic for multiple raters (King, 2004a, 2004b) was adequate for extraction, $\kappa = .54$, and excellent for identification of illness-related attributions, $\kappa = .93$. Coders reached consensus on each extracted attribution before they began rating for LACS dimensions. Both undergraduate coders then independently rated each extracted attribution for internality, controllability, universality, and responsibility; interrater reliability was excellent: $\rho_1 = .87-.94$ (Shrout & Fleiss, 1979 [3,1]). In case of disagreement between these two coders, a consensus was reached after discussion with the graduate student coder. These consensus codes are the basis for the data analyses.

Naïve ratings of interaction criticism: A single item measure was used to capture naïve, global judgments of interaction criticism after the rater watched an entire problem-solving interaction. Consistent with Renshaw et al.’s (in press) findings that perceived criticism largely reflects criticism that is viewed as destructive, coders were asked to rate relatives’ destructive criticism of the patient. Like the Perceived Criticism Measure, the item “How critical was the relative of the patient?” was rated on a scale from 1 (*not at all critical*) to 10 (*very critical indeed*). Previous research conducted with a portion of this sample (Chambless & Blake, 2009, Study 2) indicated that these naïve ratings of the *extent* of destructive criticism were more highly correlated with perceived criticism than were *frequency counts* of observed criticism coded by highly trained raters (r_s of .47 vs. .19).

Because the measure was designed to capture intuitive judgments about criticism such as those made by patients responding to the PCM, coders were not trained to achieve reliability. Nevertheless, interrater agreement was high. Codes for the two raters were composited for analysis, and the ρ_1 for their combined scores (Shrout & Fleiss, 1979 [3,2]) was .92. Coders were the same undergraduate research assistants who completed the attribution coding. Tapes were rated for criticism after the completion of all attribution coding, but the possibility that coders may have recalled their attribution ratings when watching videotapes cannot be eliminated. As a check on the validity of their ratings, their scores were correlated with the scores of a separate team of four undergraduates who, in providing ratings for Chambless and Blake (2009, Study 2), rated 37 of the cases included in the present study. Those four undergraduates had no contact with the present study, were untrained in attributional coding, and were uninformed as to patients’ attributions and perceived criticism scores. The intraclass correlation for the reliability of their combined scores (Shrout & Fleiss, 1979 [3,4]) was .94. There was good agreement between the two sets of coders, $\rho_1 = .74$ (Shrout & Fleiss, 1979 [1,1]).

Procedure—Patients accepted for treatment after the SCID completed self-report measures including the PCM, and patients and relatives were scheduled for a 10-min problem-solving

interaction. Patients and relatives were instructed to select the top two to three problems facing their relationship. They were then asked to try to reach a mutually satisfactory resolution to the first problem while being videotaped in a room alone together. If they resolved the problem in less than 10 min, they were asked to move on to a second problem. Videotapes were subsequently transcribed for attribution extraction and coding. Dyads were debriefed following the interaction, and none reported significant distress.

RESULTS

Because only 12 patients made even one attribution for a positive event, the focus of this report will be patients' attributions for relatives' negative behavior and events. Fifty-six patients made at least one negative attribution ($Mdn = 3.0$). Of these 49 women and 7 men, 34 were diagnosed with OCD and 22 with PDA. Of the relatives (14 women, 42 men), 46 were spouses, 6 mothers, and the rest other relatives. Descriptive data for this sample may be found in Table 3. Patients making negative attributions did not differ significantly from those who did not on diagnosis, $\chi^2(1, N = 70) = 0.53, p = .47$, or perceived criticism, $t(67) = 0.23, p = .82, d = 0.08$. Those interacting with spouses were somewhat more likely (84%) to make at least one negative attribution than those interacting with other relatives (67%), but this difference was not statistically significant, $\chi^2(1, N = 70) = 2.12, p = .145$. Female patients (85%) were more likely to make at least one negative attribution than male patients (58%), $\chi^2(1, N = 70) = 4.25, p = .04$.

Attributions Predict Perceived Criticism—Because attribution proportions were positively skewed, Spearman's nonparametric correlations (r_s) were used for the major analyses. The proportions of internal, personal, and controllable attributions were substantially correlated, r_s of .62–.70. Accordingly, to reduce Type I error from multiple comparisons, a composite variable of negative attributions was formed by averaging the consensus proportions for these three variables. Because internality could not be coded for any of the attributions of 5 participants (all attributions were mixed or unclear on internality/externality for these cases), $N = 51$ for remaining analyses. This composite proportion variable and the proportion of responsibility attributions were then correlated with perceived criticism.

Power calculation indicated that power for a correlation of .25 (the smaller of the two correlations obtained in Study 1 for Global Perceived Criticism and attributions) with alpha set at .05 was only .47. Accordingly, in order to avoid exacerbating Type II error no Bonferroni correction for the two comparisons was conducted.

As hypothesized, attributions for relatives' negative behavior and events were positively correlated with perceived criticism. The correlation was medium and significant for the composite variable ($r_s = .33, p = .02$) but small and not significant for responsibility attributions ($r_s = .17, p = .22$), perhaps because of the limited number of responsibility attributions in this sample. Note that the composite attribution-perceived criticism correlation was obtained for the *type* of the attributions made (i.e., whether they were internal, personal, or controllable). The sheer *frequency* of attributions for negative events and behaviors was not related to perceived criticism: The correlation was low and not significant, $r_s = .11, p = .38$.

Because the sample was made up of a number of subsets, tests of moderation of the composite variable's effect were conducted with interaction tests in multiple regression equations following procedures recommended by Aiken and West (1991). Proportion scores were subjected to an arc sine transformation for parametric analysis. Moderators tested included sex of the patient and of the relative, type of relative, diagnosis, and whether the patient made attributions for relatives' negative behaviors and events that related to the

patient's anxiety disorder. This last variable was dichotomized as 0 (*no attributions related to anxiety*) or 1 (*1 attribution related to anxiety*) because this variable was extremely skewed, with 63% of patients making no attributions to such behavior or events.

All tests of moderation were not significant and yielded small effect sizes (*srs* of $-.009$ to $.175$, $ps > .18$), with one exception: There was a trend for anxiety-related attributions to interact with the composite variable, interaction $t(47) = -1.82$, $p = .07$.

Attributions' Unique Contribution to Prediction of Perceived Criticism—As would be expected from prior research with a subsample of the patients in this study (Chambless & Blake, 2009, Study 2), observed criticism ratings in this larger sample were moderately correlated with Global Perceived Criticism ($r_s = .33$, $p < .005$), despite the mismatch in time frames for the ratings (the former was based on a 10-min interaction, whereas the latter was based on the totality of the patient-relative relationship). Moreover, attribution ratings were substantially correlated with observed criticism ratings, $r_s = .48$, $p < .001$.

Do attributions contribute to the prediction of perceived criticism above and beyond the contribution of observed criticism? A multiple regression analysis was conducted with Global Perceived Criticism as the dependent variable and transformed attributions and observed criticism entered as simultaneous predictors. When both variables were in the equation, observed criticism was no longer a significant predictor of Global Perceived Criticism, $sr = .08$, $p = .57$, whereas attributions continued to account for a significant proportion of the variance in Global Perceived Criticism, $sr = .27$, $p < .05$.

In Study 1, attributions proved to be correlated with Interaction-Specific Perceived Criticism even once the relationship of marital adjustment and attributions was statistically controlled. As would be expected, attributions and patients' marital adjustment were negatively correlated in the present study, $r = -.44$, $p < .001$. Attempts to examine the unique contribution of attributions to perceived criticism in Study 2 via regression analysis, as was done in Study 1, were hampered by the small sample of patients ($n = 37$) with marital adjustment data (some patients were not living with a spouse/partner, and there were some missing data on the DAS) and by excessive multicollinearity. With variance due to marital adjustment controlled, attributions were no longer significantly related to perceived criticism, $sr = .16$, $p = .29$. In light of the violation of the assumptions of multiple regression analysis, this finding is difficult to interpret.

DISCUSSION

Broadly speaking, the results of Study 1 were replicated in Study 2, in that negative attributions (holding that relatives' negative behaviors and events were internal to, controllable by, or unique to the relative) were moderately and significantly correlated with perceived criticism. As might be expected, patients were more likely to make negative attributions when observers rated their relatives as critical of them. However, negative attributions were associated with perceived criticism above and beyond the contribution of observer-rated criticism. These data suggest it is not only important to observe how the relative behaves but to understand how the patient construes that behavior. This pattern should be tested for replication in future research with interaction-specific ratings of perceived as well as observer rated criticism.

In some studies of EE, responsibility attributions (those simultaneously internal, global, and personal) have proved to be more correlated with negative relatives' characteristics such as hostility toward the patient than the separate dimensions of internal/external, personal/universal, or controllable/uncontrollable attributions (Barrowclough & Hooley, 2003;

Renshaw et al., 2006). This proved not to be the case for the present investigation. Whether this results from the relative rarity of responsibility attributions in this sample (yielding a restricted range for correlational analyses) or from the focus here on perceived criticism rather than EE cannot be determined. Investigation with a larger sample size is indicated.

In comparison with Study 1, the present sample was somewhat more racially diverse and decidedly more varied in terms of educational attainment. However, the great majority of patients were female. Although we found no interaction of patients' sex with the perceived criticism-attribution relationship, our power to test such an interaction was low given the small sample of men. Because sex differences are sometimes found in the relationship between attributions in intimate relationships and other variables (Bradbury & Fincham, 1990), additional data on men are required. A second significant limitation to the interpretation of this study is the use of the same coders to rate attributions and relatives' criticism during the problem-solving interactions from which the attributional statements were taken. Although the coders rated relatives' criticism only after completion of all attribution ratings, they may have recalled their prior ratings when watching the problem-solving interactions, and the correlation may have been inflated thereby. This possibility cannot be excluded. However, contamination of observed criticism ratings would not explain the pattern of the semi-partial correlations in which attributions continued to be related to perceived criticism once observed criticism was controlled, whereas perceived and observed criticism were no longer significantly correlated once attributions were controlled. Moreover, the ratings of these coders were strongly correlated with scores of another set of coders who rated part of the same sample without any knowledge of attributional coding.

General Discussion

Two studies examining the relationship between attributions of relatives' behavior during dyadic interaction and perceived criticism were conducted. In Study 1, the amount of attributional activity may have been inflated by the research methods: Participants were repeatedly asked to provide ratings for their attributions for their spouse's behavior. In contrast, Study 2 almost certainly provides an underestimate of attributional activity, in that raters could only code spoken attributions, and many other attributions may have gone unsaid. Despite the very different nature of their methodologies and their samples, these two studies yielded similar results: Perceived criticism is higher when relatives draw negative attributions about one another's behavior during dyadic interactions whether respondents are psychiatric patients or married individuals from the community. This finding points toward possible treatment interventions in cognitive-behavioral couples/family therapy to reduce perceived criticism. In light of the relationship of perceived criticism to poor treatment outcome (Chambless & Steketee, 1999; Fals-Stewart et al., 2001; Hooley & Teasdale, 1989; Kwon et al., 2006), amelioration of perceived criticism might lead to better treatment success or prevention of relapse.

Research on EE has consistently demonstrated that relatives who make more negative attributions about patients are more likely to be critical and hostile when they speak about the patient (e.g., Barrowclough & Hooley, 2003) than relatives who make fewer such attributions. These findings help us understand why some relatives faced with living with a severely ill psychiatric patient remain low in EE, whereas others become critical and hostile. Similarly, the present data indicate that to understand perceived criticism, we need not only to assess how critical the relative appears to be to observers but also how the patient construes the relative's behavior. Treatment implications follow from these findings. In cognitive-behavioral family therapy for schizophrenia and bipolar disorder (e.g., Barrowclough & Tarrier, 1992; Miklowitz, 2008) psychoeducation about the patient's disorder is used to reduce relatives' negative attributions and thereby, it is believed, their

hostility and criticism.⁵ The therapist encourages relatives to consider the patients' behavior as stemming from a legitimate illness rather than willful character flaws. This strategy is limited where perceived criticism is concerned, in that relatives may have no illness to which their behavior can be attributed. However, a discussion of the patients' perceptions (e.g., that the relative intended to be destructive) versus the relatives' understanding of their motivations may still prove fruitful in prompting the patient to consider alternative explanations for relatives' behavior. Certainly it is the case that patients may accurately perceive their relatives' motivations, but it is often true that even negative behavior on the relatives' part may be placed in a more positive context than the patient first believes. Whether cognitive-behavioral treatment targeting perceived criticism and other aspects of negative relative-patient interactions reduces the effects of perceived criticism on treatment outcome in controlled research is a worthy topic of future investigation.

A question left unsettled by these studies is whether attributions add to the prediction of perceived criticism once these variables' mutual relationship with marital adjustment has been taken into account. In Study 1 this proved to be the case for prediction of interaction-specific perceived criticism. Where global perceived criticism is concerned, this did not seem to be true. However, the results from Study 2 on this point need to be interpreted with caution because of the relatively small number of patients with data on the DAS and violation of the assumptions of multiple regression. Additional research on this point with a larger sample and a longitudinal approach should be conducted.

For all that these two investigations differ in their methodologies, they share one common limitation. The implicit hypothesis for this research is that negative attributions make a causal contribution to the perception of criticism. However, our correlational design does not permit causal inference. Moreover, the hypothetical temporal sequence of negative attributions followed by perceived criticism was not established because perceived criticism was measured before attribution ratings were obtained. In future research it would be important to assess attributions before perceived criticism to permit a stronger test of the hypothesis.

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⁵We are unaware of any research testing whether change in attributions mediates reductions in criticism and hostility with family interventions.

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Table 1

Descriptive Data for Husbands' and Wives' Community Samples: Medians and Wilcoxon Signed Ranks Tests

Variable	<i>Mdn</i>	<i>z</i>	<i>p</i>
Perceived Criticism-Global	W 3.00	-1.03	.31
	H 3.00		
Perceived Criticism-Interaction Specific	W 2.50	-2.32	.02
	H 3.00		
Negative Attributions	W 2.00	-2.94	.003
	H 1.43		

Note. W = Wives, H = Husbands.

Table 2

Correlations of Interaction-Specific Perceived Criticism, Negative Attributions, and Marital Adjustment for Husbands' and Wives' from the Community Sample: Wives' Data Above the Diagonal and Husbands' Data Below the Diagonal

	Attrib	ISPC	GPC	DAS
WAttrib	-	.38**	.34*	-.37**
WISPC		-	.43**	-.27
WGPC			-	-.66***
WDAS				-
HAttrib	-	.35*	.25	-.08
HISPC		-	.47**	-.08
HGPC			-	-.33*
HDAS				-

Note. W = wives' data, H = husbands' data, Attrib = Negative Attributions, ISPC = Interaction-Specific Perceived Criticism, GPC = Global Perceived Criticism; DAS = Dyadic Adjustment Scale.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 3

Descriptive Data for the Clinical Sample

Measure	<i>M</i>	<i>SD</i>	<i>Mdn</i>
Pts. Age	35.39	9.74	33
Rel. Age	40.62	12.49	39
Global PC	5.43	2.74	6
Internal Attrib.	.60	.38	.60
Controllable Attrib.	.57	.41	.60
Personal Attrib.	.46	.35	.35
Composite Attrib.	.56	.35	.56
Responsible Attrib.	.33	.39	.17
Naïve observers' crit.	4.16	2.26	3.50

Note. Pts. = patients, Rel. = relatives, PC= Perceived criticism, Internal Attrib. = proportion of internal : internal + external attributions, Controllable Attrib. = proportion of controllable : controllable and uncontrollable attributions, Personal Attrib = proportion of personal : personal + universal attributions, Responsible Attrib. = proportion of attributions that were internal, personal, and controllable, Naïve observers' crit. = Relatives' criticism during problem-solving interactions as rated by naïve observers.