

## Attributional Style in Delusional Patients: A Comparison of Remitted Paranoid, Remitted Nonparanoid, and Current Paranoid Patients With Nonpsychiatric Controls

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Many studies have found that people experiencing persecutory delusions have a marked tendency to use external-personal attributions when establishing the causes of negative events. Although nonclinical populations also tend to attribute negative events to external causes, those causes are typically believed to be universal in nature, rather than personal. The central goal of the present study was to investigate whether individuals with remitted persecutory delusions would display this external-personal bias regarding negative events, in comparison to remitted patients whose delusions were not paranoid in nature and to nonpsychiatric controls. Results indicate that currently paranoid patients were significantly more likely than all other groups, including the remitted paranoid group, to use external-personal attributions in negative events. Interestingly, all patient groups also were found to be significantly more likely than the controls to use internal-personal and internal-universal attributions when explaining negative events.

*Key words:* schizophrenia/psychosis/attributional style/self-serving bias/social cognition

### Introduction

Causal attributions are the explanations people give for personal events. An accumulation of research has suggested that the types of causal attributions typically used by a person, which constitute attributional style, are associated with the development and maintenance of psychological disorder.<sup>1–3</sup> Most attribution research has tested the link between depression or anxiety and attributional style; however, there is also some evidence

of a particular attributional style in people with persecutory delusions.<sup>4,5</sup> Bentall et al<sup>4,5</sup> have theorized that persecutory delusions are, in part, the result of an exaggerated “self-serving bias” employed by the psychotic patient when explaining life events, in an effort to preserve self-esteem. The person having adverse experiences will attribute these negative events to agents outside of the self, thereby deflecting self-blame and feelings of low self-worth. Similarly, the person will display an exaggerated tendency to attribute positive events internally, crediting his/her own attributes and actions for good outcomes. The application of a self-serving bias can help the individual to diminish the discrepancy between the “real self” (who the person is) and the “ideal self” (who the person feels he/she ought to be), thus serving a defensive function for the person’s sense of self.<sup>5</sup> This self-serving attribution pattern is characteristically displayed by healthy individuals, but some research suggests that the tendency is more pronounced in patients with persecutory delusions.

Previous research has compared patients currently suffering from persecutory delusions to depressed patients,<sup>3,6,7</sup> to patients whose current delusions are not persecutory,<sup>8</sup> and to nonpsychiatric controls.<sup>3,8,9</sup> Some studies employing the Attributional Style Questionnaire (ASQ)<sup>10</sup> have provided support for the hypothesis that delusional patients have an exaggerated externality when attributing causes for negative events, although an exaggeration of the other component of the self-serving bias, that of using primarily internal attributions for positive events, has not been demonstrated.<sup>6,8,11</sup> Furthermore, research has not consistently found an externalizing tendency for negative events in deluded patients that is significantly different from a nonpsychiatric control group and that is specific to patients whose delusions are persecutory.<sup>12</sup> Several studies have failed to find a greater self-serving bias in persecutory delusional patients than in nonpsychiatric controls.<sup>13–16</sup> Thus, there is mixed evidence for a greater-than-normal self-serving bias in persecutory-deluded schizophrenia patients.

The examination of a personal/universal dimension could help to better describe attributional patterns in

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paranoid patients, as well as to explain the mixed results of studies that included only the internal/external dimension. According to a model put forth by Bentall and Kinderman,<sup>4</sup> attributions of events to the actions of specific others are designated external-personal, whereas attributions of events to chance or circumstance are considered external-universal. Bentall hypothesized the external bias displayed by paranoid individuals to be primarily personal, with external-universal bias more common in nonclinical populations. Support for the utility of this added dimension is mixed. Kinderman and Bentall<sup>17</sup> found that patients with persecutory delusions showed no externalizing bias for negative events relative to controls but did show a pronounced personalizing bias in the external attributions they made. However, Martin and Penn<sup>14</sup> found no significant differences between persecutory deluded, nonpersecutory deluded, and nonpsychiatric control participants; all showed a similar self-serving bias and a personalizing tendency in negative events. Janssen et al<sup>18</sup> found an exaggerated tendency to use external attributions for negative events in delusional patients, but failed to find a personalizing bias. These results indicate a need to further elucidate the relationship between persecutory delusions, external attributions, and a personalizing bias.

Most studies of attribution have employed the ASQ<sup>10</sup> or the Internal, Personal, Situational Attributions Questionnaire (IPSAQ),<sup>19</sup> both of which ask respondents to generate attributions for hypothetical social events. These measures have acceptable internal consistency and are easy to administer. However, some investigators have commented that some psychotic patients have had difficulty understanding the items on the ASQ and IPSAQ, perhaps lacking the level of cognitive ability needed to “pretend” that the hypothetical events have actually occurred in their lives.<sup>20</sup> Furthermore, these measures may be low in ecological validity; the hypothetical events may not hold much meaning for participants. Finally, the measures have the same disadvantages as many other self-report measures, including demand characteristics and the potential for social desirability bias.

A different system of measuring attributional style, the Leeds Attributional Coding System (LACS),<sup>21</sup> has been developed in an effort to address these concerns. The LACS is a method by which attributions are extracted from the natural speech of participants talking about their lives and then rated for internality, universality, etc. Because participants are speaking about their own lives, the attributions generated are thought to be more meaningful and to more closely mirror the participant’s real-life attributional patterns. Furthermore, the participant does not know that the narrative will be used to determine their attributional style, so the risk of social desirability bias is decreased. Several studies that have investigated attributional style by coding natural speech offer support for the use of this technique.<sup>22</sup> The LACS has

been used in a variety of contexts, including the analysis of attributions made by individuals with psychotic disorders<sup>20</sup> and the parents of individuals with schizophrenia.<sup>23</sup> A study of the attributions made by delusional patients using the LACS showed some attributional patterns resembling the patterns found using the ASQ, demonstrating validity of this coding system.<sup>20</sup>

Existing research has yielded insight into the nature of attributional biases in currently delusional patients; however, only a few studies have been conducted involving remitted delusional patients.<sup>24,25</sup> With the aim of further elucidating the role of attributional style at different stages of the illness, the present study investigated whether schizophrenia patients with remitted persecutory delusions display a similar attributional style to patients who currently have persecutory delusions. Furthermore, this study tested for differences in attributional style between schizophrenia patients whose past, but remitted, delusions were persecutory and patients whose remitted delusions were not persecutory in nature. Finally, the attributional style of these 3 patient groups was compared with that of nonpsychiatric controls. The present study is the first to investigate whether remitted delusional patients’ attributions differ according to the primary type of delusions that were held during active psychosis, using a nonobvious measure of attributional style.

### *Hypotheses*

1. It was hypothesized that a self-serving bias would be observed across groups, with a higher percentage of internal attributions made for positive events than for negative events and a higher percentage of external attributions for negative events than for positive events. No differences between groups were predicted for use of internal versus external attributions for events of either valence. This hypothesis is consistent with the predominance of research findings, which have shown a similar self-serving bias in patients and nonpsychiatric controls when only the internal/external dimension is considered.
2. It was hypothesized that the remitted persecutory delusional group and the current persecutory delusional group would display a greater use of external-personal attributions for negative events, when compared with the control group and to the remitted delusional patients whose past delusions were not persecutory in nature.
3. According to Bentall’s conceptualization of the ideal self vs real self-discrepancy which leads to a pronounced self-serving bias in schizophrenia patients, an exaggerated internalizing bias should be predicted for positive events in patients with persecutory delusions. However, research thus far has not found evidence of an exaggerated internalizing bias for positive events. Thus, no differences were expected

**Table 1.** Descriptive Information for Sample

Demographic Variable	Current Paranoid	Past Paranoid	Past Nonparanoid	Controls
Number of participants	18	30	17	29
Female, %	33.3	23.3	52.9	34.5
Caucasian, %	64.7	76.7	47.1	69.0
Mean age (in years)	37.89 (10.82)*	36.57 (9.15)*	35.59 (8.01)*	37.66 (7.98)*
Mean years of education	11.83 (1.98)*	13.10 (1.71) <sup>†</sup>	12.06 (1.30)*	13.52 (1.41) <sup>†</sup>
Mean GAF score	43.82 (8.57) <sup>†</sup>	58.78 (10.34)*	54.24 (11.33)*	84.52 (4.46) <sup>+</sup>
Mean Shipley IQ score	86.29 (15.92)*	91.10 (15.50)*	83.00 (13.76)*	101.97 (11.35) <sup>†</sup>

*Note:* Means sharing the same superscript do not significantly differ. Contingency coefficients derived from chi-square analyses indicate that the between-group differences in gender and in ethnicity were not significant. GAF, Global Assessment of Functioning.

between groups in external-personal, external-universal, internal-personal, or external-universal attributions for positive events.

## Methods

### Participants

Participants were drawn from a pool of participants in 3 larger studies of language.<sup>26–28</sup> Participants' ages ranged from 18 to 50.

*Patients.* Clinical participants included in this study were outpatients who met criteria for a diagnosis of schizophrenia or schizoaffective disorder (depressive or bipolar) according to the guidelines of the "Diagnostic and Statistical Manual of Mental Disorders" (DSM-IV; 4th ed.).<sup>29</sup> Diagnoses were reached through the use of a semi-structured diagnostic interview, the Schedule for Affective Disorders and Schizophrenia—Lifetime Version (SADS-L),<sup>30</sup> which was modified slightly for DSM-IV criteria. Because no group differences were found on the attributional style variables according to diagnosis, patients with schizoaffective disorder and patients with schizophrenia were included in analyses as a single sample.

All participants were recruited from a community mental health clinic. Participants were excluded from the study if they met DSM-IV criteria for current (past year) alcohol or drug abuse or if they supplied historical information indicating the possibility of organic brain damage (eg, alcohol abuse resulting in detoxification, solvent abuse, mental retardation, head injury, or seizure disorder). Because the larger language studies included measures of natural speech, only native English speakers were included. Descriptive information for the patient sample is provided in table 1.

A total of 65 clinical participants were included in the present study. Three groups of patients were selected from the larger study samples based on symptom ratings:

a remitted paranoid group, a remitted nonparanoid group, and a current paranoid group. A symptom rating scale, the Positive and Negative Symptoms Scale (PANSS),<sup>31</sup> was used to select patients who were no longer experiencing delusions. All patients receiving a score of 1 (none) or 2 (questionable) for the PANSS item "delusions" were eligible for inclusion in 1 of the 2 "remitted" patient groups. The SADS-L was then used to separate these remitted participants into the past paranoid or the past nonparanoid group depending on whether they had ever experienced persecutory delusions. The PANSS also was used to select patients for the current paranoid group. In order to be included in this group, participants were required to have a score of at least 4 (moderate) on PANSS "suspiciousness" and a score of 4 (moderate) on PANSS "delusions." A score of moderate on PANSS suspiciousness indicates that "distrustfulness is clearly evident and intrudes on the interview and/or behavior, but there is no evidence of persecutory delusions. Alternatively, there may be indication of loosely formed persecutory delusions, but these do not seem to affect the patient's attitude or interpersonal relations." A score of moderate on delusions is defined as "presence of either a kaleidoscopic array of poorly formed, unstable delusions, or a few well-formed delusions that occasionally interfere with the patient's thinking, social relations, or behavior." The PANSS suspiciousness item has been used similarly in other attribution studies to separate patients into paranoid and nonparanoid groups.<sup>32</sup>

The mean combined score for this participant group was 9.61 (SD = 1.14). Combined scores ranged from 8 to 12. Patients who reported never having experienced delusions were not included in the present study.

Data on antipsychotic medications were available for 63 of 65 participants. Thirty-nine of the clinical participants were receiving only atypical antipsychotic medication, 19 were receiving only typical antipsychotic medication, 2 were receiving both typicals and atypicals, and 3 were receiving no antipsychotic medications. Of the 3 who were not receiving antipsychotic medication, 2

were members of the past nonparanoid group, and 1 was a member of the current paranoid group.

*Controls.* Twenty-nine control participants roughly matched to the patients on age, race, and gender were recruited from university support staff through the use of fliers. The same exclusion criteria applied to patients were applied to controls; additionally, controls were not included if a history of psychotic symptoms was endorsed. The SADS-L<sup>30</sup> was used to screen for psychosis, current alcohol or substance abuse, and history suggestive of neurological disorder or damage.

*Measures and Procedure*

All data were collected by graduate students trained in the administration and scoring of the SADS-L. These same graduate student researchers used the PANSS to produce symptom ratings for the clinical participants. Acceptable interrater reliability was obtained for the measures.<sup>26-28</sup>

*Intellectual Functioning.* The Shipley Institute of Living Scale<sup>33</sup> was used to estimate participants' intellectual functioning. The Shipley is comprised of 2 subtests, one measuring vocabulary and the other measuring abstract reasoning. Subtest scores were summed and converted to estimated WAIS-R IQ scores.<sup>34</sup>

*Assessment of Overall Functioning.* Interviewers used the Global Assessment of Functioning (GAF) scale to rate each participant's overall symptom severity and level of functioning at the time of data collection.<sup>29</sup> The GAF scale is divided into 10 ranges of functioning with a possible score of 1-100. A high GAF score indicates good overall functioning.

*Speech Samples.* Ten-minute samples of participants' speech were recorded at each of 2 testing sessions. Participants each provided one speech sample detailing positive, pleasant memories from their own lives and one speech sample detailing negative, aversive memories. Interviewers used minimal prompts when needed. The

audiotapes of the participants' speech were transcribed and proofread for accuracy. Speech samples were collected from participants within 2 weeks of the diagnostic interview and subsequent rating of symptoms.

*Identification of Attributions.* The primary author extracted attributions from each speech sample, blind to identity and group membership of the participants. A statement was considered an attribution if cause and effect were clearly discernable. Only attributions of events that involved the speaker were included.

*Leeds Attributional Coding System.*<sup>21</sup> Coding of events was also done blind to identity and group membership. Each attribution was coded as positively, negatively, or neutrally valenced, depending upon the outcome of the event. Neutral-valenced attributions were not included in analyses. Attributions were then coded for internal-externality using the LACS. Following this method, if the cause supplied by the speaker was a personal characteristic of the speaker or an action taken by the speaker, the attribution was coded as internal; if the event was caused by a force outside the speaker (ie, the situation or the actions of others), the item was coded as external. Every item was coded as either internal or external.

Finally, each attribution was coded as personal or universal. This variable captures whether the event, cause or effect, indicated something unique about the individual. For example, an event with a cause or outcome that applies more frequently to the subject than to relevant others would be designated as "personal," while a cause and effect that is common to the majority of relevant others would be coded as "universal." Thus, a universal attribution indicates that the outcome would be likely to happen to the majority of people in the same situation, whereas a personal attribution indicates that the event took place because that particular individual was involved. See table 2 for examples of LACS coding.

It is important to note that the LACS differs from other attributional rating systems in its conceptualization of the personal/universal dimension. When assessing the universality of an attribution, the LACS asks whether the

**Table 2.** LACS Ratings Examples

Event	Cause	Valence	Internality	Universal
I felt numb for a long time	My mother died	Negative	External	Universal
I had 2 broken legs	They pushed me off the fire escape	Negative	External	Personal
I had to quit my second job	I felt worn out	Negative	Internal	Universal
I broke into his house	I drank too much	Negative	Internal	Personal
I took a long walk in the park	The weather was beautiful	Positive	External	Universal
I got free tickets to Disney world	My cousin works there	Positive	External	Personal
I take vacations with them	I love spending time with my kids	Positive	Internal	Universal
I received a full scholarship	I was an excellent student	Positive	Internal	Personal

event occurred only because the particular person (the subject) was involved. In contrast, attribution research conducted using the IPSAQ has conceptualized a personal attribution as one in which the subject has linked the cause to the actions of specific others.<sup>35</sup> Because the LACS has defined the personal/universal dimension in this manner, it is possible for the researcher to distinguish between internal-personal and internal-universal attributions. The present study has included the 4 attribution types of internal-personal, internal-universal, external-personal, and external-universal, rather than the 3 categories of internal, external-personal, and external-universal more commonly used in attribution research.

In order to examine interrater reliability on the positive/negative, internal/external, and personal/universal dimensions, a second coder independently applied the LACS to the 297 attributions extracted from sixteen of the speech samples. Percentage agreement on the valence of these attributions was 87% ( $\kappa = .77$ ). Most disagreements involved the assignment of "neutral" valence. The 2 raters had 88% agreement on the internal/external dimension ( $\kappa = .75$ ) and 84% agreement on the personal/universal dimension ( $\kappa = .68$ ). Interrater reliability in this study is similar to reliability reported in other studies using the LACS.<sup>20,23,36</sup>

### Analyses

To test the hypotheses of the study, first a 4 (group)  $\times$  2 (positive event versus negative event) mixed analysis of variance was performed, with internality percentage as the dependent variable. Then, 2 one-way analyses of variance were conducted to test whether the 4 participant groups differed in their use of the 4 attribution subtypes (internal-personal, internal-universal, external-personal, external-universal). Analyses were conducted separately for positive valence and negative valence events.

## Results

### Preliminary Analyses

**Demographic Data.** The 4 participant groups did not significantly differ from one another on the variables of gender, ethnicity, or age. Between-group differences were found on the variables of education, GAF score, and Shipley-derived estimated WAIS IQ score (see table 1). The differences were primarily between patients and controls, with patients having less education, lower GAF scores, and lower IQ scores than controls.

**Numbers of Attributions.** Any participant who made fewer than 5 attributions for either positive or negative events was excluded from all analyses. The concern was that a percentage score based on such a small number of attributions would be overly affected by 1 or 2 attributions and potentially would have an undue impact on

the mean for the group. See table 1 for the sample size of each group. There were 9 participants initially selected for inclusion in the study who were later excluded from analyses due to insufficient numbers of attributions. Of these 9 participants, 4 were from the current paranoid group, 3 were from the past paranoid group, and 2 were from the past nonparanoid group. In 3 of these cases (2 current paranoid participants and 1 past nonparanoid participant), the speech samples were largely uncodeable due to thought disorder.

A 1-way analysis of variance was conducted in order to test whether the 4 participant groups differed in their mean number of attributions made. Because differences between the 3 patient groups on number of attributions did not approach significance, the mean number of attributions for all patients is reported. Controls (mean = 21.38, SD = 7.90) made significantly more attributions than patients (mean = 12.00, SD = 5.79) for positive events,  $t(92) = -6.46$ ,  $P < .001$ . The same was found for attributions for negative events, with controls (mean = 23.72, SD = 7.13) making more attributions than patients (mean = 17.69, SD = 7.80),  $t(92) = -3.56$ ,  $P < .001$ . Correlations were conducted in order to test whether the number of attributions made was related to the types of attribution made. Because none of the statistics approached significance, it can be stated that the number of attributions made by participants was not appreciably related to the types of attributions used.

### Attribution Scores

Two scores were calculated for each participant group for analyses of internality. The negative internality score is the percentage of negative attributions that are internal in nature, rather than external, and the positive internality score is the percentage of positive attributions that are internal in nature. LACS scores for each participant were also calculated for the percentage of internal-personal, internal-universal, external-personal, and external-universal attributions for each of the 2 types of events (positive and negative). Percentage scores were calculated as the percentage of negative attributions that fell into each of the 4 categories and the percentage of all positive attributions that fell into each of the 4 categories. Percentage scores were used for all analyses rather than frequency scores because each participant made a different number of attributions. Thus, the percentage scores used in this study can be thought of as frequency scores, controlling for differences in total number of attributions made. Skewness and kurtosis were in acceptable range for all variables.

### Main Analyses

**Internality of Attributions.** Internality scores are presented in table 3. It was predicted that all participants would show greater internality when explaining positive

**Table 3.** Internality Percentages for all Participant Groups,  $n = 94$

Valence	Current Paranoid	Past Paranoid	Past Nonparanoid	Control	Total
Positive event	49.31 (13.64)	47.59 (18.28)	50.07 (18.07)	50.81 (14.50)	49.36 (16.11)
Negative event	43.75 (15.28)	48.39 (17.79)	48.97 (14.08)	41.96 (15.56)	45.62 (16.05)

*Note:* Neither between-group nor within-group differences approached significance.

events than when explaining negative events. Although results were in the predicted direction, they did not support this hypothesis because there was no main effect for valence,  $F(1, 90) = 2.43$ , not significant (ns). As predicted, groups did not differ in their internality patterns,  $F(1, 90) = .31$ , ns, nor was there a group by valence interaction,  $F(3, 90) = 1.06$ , ns.

*Analyses Including the Internal/Universal Dimension.* This study hypothesized that participants with remitted persecutory delusions and participants with current persecutory delusions would display a greater use of external-personal attributions for negative events than the 2 never-paranoid groups. See table 4 for means and standard deviations for negative valence events. There was a significant between-group difference in the use of external-personal attributions for negative events,  $F(3, 90) = 3.19$ ,  $P < .05$ . Post hoc tests indicate that the current paranoid group used a significantly higher percentage of these attributions when compared with all 3 other groups and that the other groups did not significantly differ from one another.

There were other group differences as well. There was a significant difference between groups in their use of internal-personal attributions for negative events,  $F(3, 90) = 6.90$ ,  $P < .001$ . Post hoc tests reveal that the control group used a lower percentage of these attributions than did any of the patient groups. The use of internal-universal attributions for negative events also differed by group,  $F(3, 90) = 5.15$ ,  $P < .01$ , such that the control group used a significantly higher percentage of these attributions compared with all 3 patient groups. Differences between groups also were found in the use of external-universal attributions for negative events,  $F(3, 90) = 3.40$ ,  $P < .05$ . The current paranoid and past

paranoid groups used a significantly lower percentage of external-universal attributions than did controls.

Group differences in attributions for positive events were also tested, although no group differences were predicted. See table 5 for means and standard deviations for positive valence events. When providing causes for positive events, there was a significant between-group difference in the use of external-personal attributions, such that the current paranoid group used a significantly higher percentage of these attributions when compared with the controls. However, in contrast with the finding for negative events, the current paranoid group did not use a significantly greater percentage of external-personal attributions for positive events than did the other 2 patient groups.

Differences were found between groups in their use of internal-universal attributions for positive events,  $F(3, 90) = 3.20$ ,  $P < .05$ , such that the current paranoid and past paranoid groups used a significantly lower percentage of these attributions than did the past nonparanoid and control groups. No group differences were found in the use of external-universal or internal-personal attributions for positive events. Effect sizes were small for all significant analyses, ranging from .10 to .19.

**Discussion**

The present study hypothesized that current paranoid and past paranoid patients would use external-personal attributions for negative events to a greater extent than would the past nonparanoid and control groups. As predicted, current paranoid patients were significantly more likely to use external-personal attributions when explaining negative events than were the never-paranoid patients and the

**Table 4.** Attributions Made for Negative Events, in Percentages ( $n = 94$ )

Variable	Current Paranoid	Past Paranoid	Past Nonparanoid	Control	Significant Differences
Internal personal	35.10 (14.87)	34.82 (14.89)	37.31 (11.56)	21.36 (14.09)	C < CP, PP, PNP
Internal universal	8.38 (7.33)	13.20 (11.14)	11.65 (12.01)	20.61 (12.66)	C > CP, PP, PNP
External personal	33.98 (16.44)	25.15 (13.32)	21.01 (17.61)	21.82 (12.32)	CP > PP, PNP, C
External universal	22.53 (15.32)	26.82 (15.84)	30.02 (10.28)	36.22 (17.16)	CP, PP < PNP, C

C, control; CP, current paranoid; PP, past paranoid; PNP, past nonparanoid.

**Table 5.** Attributions Made for Positive Events, in Percentages ( $n = 94$ )

Variable	Current Paranoid	Past Paranoid	Past Nonparanoid	Control	Significant Differences
Internal personal	28.47 (17.00)	27.28 (16.68)	19.97 (17.72)	21.61 (12.49)	No significant differences
Internal universal	20.84 (13.63)	20.31 (13.26)	30.10 (15.87)	29.20 (14.34)	CP, PP < PNP, C
External personal	21.37 (16.76)	16.04 (13.53)	15.22 (13.09)	11.91 (10.02)	C < CP
External universal	29.32 (17.00)	36.37 (17.66)	34.71 (17.95)	37.28 (16.56)	No significant differences

C, control; CP, current paranoid; PP, past paranoid; PNP, past nonparanoid.

nonpsychiatric controls. Furthermore, the external-personal-negative attribution was the only type in which the current paranoid group differed from both other patient groups. Contrary to expectations, remitted paranoid patients more closely resembled the 2 nonparanoid groups in their use of the external-personal attribution type than they did the current paranoid patients.

All participants were expected to demonstrate a self-serving bias, such that all would use more external and fewer internal attributions in the explanation of negative events than in the explanation of positive events. No evidence for the self-serving bias was found in any of the participant groups; all participants tended to show a roughly 50/50 split between internal and external attributions, regardless of the valence of event being considered.

#### *External-Personal-Negative Attributions*

It was predicted that the attribution patterns of the current paranoid and past paranoid groups would resemble one another closely. This was the case for most of the study variables, with the notable exception of the external-personal-negative attribution. The hypotheses of the present study were based, in part, on the idea that a stable tendency to make external-personal attributions for negative events would be found in the patients who had ever experienced persecutory delusions because this attributional tendency would predispose them to have persecutory delusions. However, one possible interpretation of the results is that a marked increase in the use of external-personal attributions for negative events is state related (ie, dependent on the presence of persecutory delusions), whereas other differences from nonpsychiatric controls in attributional style are more stable and trait related.

Although cross-sectional, the data suggest that attributional style in patients with a history of persecutory delusions is unstable and changeable. One interpretation of the results is that persecutory delusions actually cause changes to attributional style, thus making the external-personal-negative bias merely a symptom of the disorder. An interpretation more closely matching Bentall's model can also be applied to the data. It is possible that negative events serve to trigger attributions protective of self-esteem, and these defensive attributions contribute to

the development of symptomatology. Both these models allow for some instability in attributional style. A stress diathesis model, in which negative events and a predisposition toward externalizing for negative events together lead to the development of persecutory delusions, is not supported by the present study because past paranoid patients did not resemble current paranoid patients in their use of external-personal attributions for negative events.

#### *Use of Other Attributions*

Other differences between patients and controls in the use of attributions were found, most notably the patients' greater endorsement of internal-personal causes of negative events. This finding could perhaps be explained by considering the actual differences found between the lives of patients and controls. It is possible that patients showed a tendency to attribute negative events to mental illness, an internal-personal cause. Furthermore, this type of attribution may be reality based, reflecting an accurate appraisal of the situation rather than an attributional style or bias.

Current paranoid patients showed a tendency to use external-personal attributions for negative events when compared with all other groups, as predicted; however, they also showed greater use of this type of attribution for positive events when compared with controls. This finding runs contrary to any predictions one could make based on the self-serving bias. It is noteworthy that all patient groups were significantly more likely to use external-personal attributions for positive events when compared with controls and that in addition only the current paranoid group differed from controls in the use of this attribution for negative events. The greater use of external-personal attributions by current paranoid patients, regardless of event valence, raises another interesting possibility. Externality of an attribution may also carry with it the implication of uncontrollability. If some patients tend to believe that most events are caused by sources outside of themselves, it could follow that they believe others have more control over these events than they themselves do. Current paranoid patients' greater use of the external-personal attribution could be a reflection of a belief in a particular type of external locus of control, such that they feel uniquely

(hence, the “personal” component of the external-personal attribution) less able to control the things that happen to them when compared with other people.

### *Methodological Strengths and Limitations*

One strength of the LACS and similar attribution coding systems is that they use real-life events presumably relevant to the participant. This asset of the coding system has its attendant drawbacks, however. Because participants provide their own events to be used in analysis, each participant is applying attributions to entirely different events than the next participant. As a result, it is possible that differences in attributional style scores are colored by differences in the types of events provided by participants of different groups. Another drawback to this approach is that the coders must infer attributional style from natural speech, rather than asking the participant to categorize the attribution themselves. Other research has found that patients’ categorizations of their own attributions do not consistently correspond with others’ categorizations of those same attributions.<sup>14</sup>

In order to ensure that the LACS was being used in a reliable way for this study, attribution extraction and coding by a second researcher was compared with that of the primary coder. Although interrater reliability was adequate, the kappas were in the lower range of acceptability for the personal/universal category. Measures applied to narrative samples are typically less reliable than questionnaire responses, and one cannot expect perfect reliability when these types of measures are used. Given the numerous advantages of coding natural speech, this limitation was judged to be an acceptable one.

As previously noted, the LACS uses a different definition of the personal/universal dimension than the definition found in most other measures of attributional style. Consequently, the results of this study cannot be said to correspond exactly to other studies in which the IPSAQ or ASQ have been employed, particularly in analyses using the external-personal attribution. Although this reduced ability to compare the present results to past research is a limitation, it can also be argued that the LACS offers new, interesting information regarding the attributional style of people with persecutory delusions. For example, the application of the personal/universal dimension to internal attributions allowed us to investigate whether the speaker feels that their attributes or actions are unique to themselves. The belief that one is “different,” “special,” or “weird” and that this uniqueness is the cause of events in one’s life is perhaps an interesting avenue to explore when studying the explanatory style of schizophrenia patients.

This study examined a fairly small sample, thus statistical power was limited. Multiple comparisons were made, increasing the possibility of type I error. Because the analyses were hypothesis driven, the risk of type I er-

ror was considered tolerable. However, unexpected results were found when analyzing attributions for positive events. It is possible that these results were “false positives.” The results of analyses involving attributions for positive events should be considered highly preliminary, requiring caution in their interpretation. Still, it is interesting to note that the greatest differences in attributions for positive events were found between current paranoid and control participants and resembled the differences found between groups in attributions for negative events.

Due to its cross-sectional design, this study can offer only preliminary evidence for the state dependence of a bias. Only by assessing for changes in attributional style within subjects over time can this issue be addressed fully. That being said, the current study clearly suggests that the externalizing/personalizing bias is associated with the actual, current presence of persecutory delusions and may diminish if these delusions remit.

### **Conclusions**

This study offers new information about the cognitions generated by people with schizophrenia when explaining life events. Using an ecologically sound methodology, a distinct attributional pattern was found in current paranoid patients when compared with remitted delusional patients (even those whose past delusions were persecutory), such that the current paranoid patients relied to a greater degree on external-personal attributions for negative events. Findings did not, however, support the idea of an exaggerated self-serving bias. Rather, paranoid patients were more likely to indicate that there was something unique about them causing external forces to bring about both negative and positive life events.

The present results suggest that, because there is a link between persecutory content and attributions, therapeutic approaches that help to retrain patients in their ways of explaining life events could help in the treatment of schizophrenia. Cognitive behavioral therapy is clearly a good candidate for this purpose because its main purpose is to modify maladaptive cognitions and beliefs. Indeed, a growing body of research suggests that cognitive behavioral therapy is effective in improving mental state and overall functioning, as well as reducing noncompliance in individuals with schizophrenia.<sup>37</sup> The findings of this study can offer information on specific facets of delusional thought that are best targeted by therapeutic interventions, as well as increasing understanding of the mechanisms behind the formation and maintenance of paranoid delusions.

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