

# Attributional Style in Schizophrenia: An Investigation in Outpatients With and Without Persecutory Delusions

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## Abstract

The attributional style of outpatients with schizophrenia with and without persecutory delusions was investigated. Thirty individuals with schizophrenia were divided into persecutory-deluded and non-persecutory-deluded groups based on a score of 5 or higher on the suspiciousness item from the Expanded Brief Psychiatric Rating Scale (BPRS-E). The two resulting groups, and a nonclinical control group, were administered a battery of attributional measures, and their attributional responses were coded by both the subjects themselves and a pair of independent raters. The results showed evidence of a self-serving bias for subjects with persecutory delusions; however, this bias was not unique to those with persecutory delusions, and it disappeared when independent raters evaluated subjects' causal statements on a reliable measure of attributional style. Subjects with persecutory delusions tended to show a stronger bias toward blaming others rather than situations for negative outcomes, and there was a linear association between persecutory ideation and a self-serving attributional style. Finally, there were significant discrepancies between the attributional ratings of the persecutory-deluded subjects and those of independent judges. Implications for future research are discussed.

**Keywords:** Attributional style, self-serving bias, paranoid delusions, schizophrenia, social cognition.

*Schizophrenia Bulletin*, 28(1):131-141, 2002.

There has been growing interest in the social-cognitive aspects of schizophrenia (Penn et al. 1997), particularly in paranoia and persecutory delusions (Bentall et al. 1994; Bentall and Kinderman, in press). Specifically, it has been hypothesized that negative life events (e.g., negative evaluations by others) trigger a negative self-concept by creating discrepancies between individuals' perceptions of their "actual self" (i.e., attributes they believe they pos-

sess) and their "ideal self" (i.e., attributes they would like to possess). Persecutory delusions function to reduce these discrepancies through an exaggeration of the self-serving bias found in normal populations (i.e., attributing negative outcomes to the actions of others and positive outcomes to one's own actions) (Bentall and Kinderman, in press).

Several studies have provided evidence for an exaggerated self-serving bias among individuals with persecutory delusions relative to both individuals with depression and normal controls, using the Attributional Style Questionnaire (ASQ) (Kaney and Bentall 1989; Candido and Romney 1990; Kinderman et al. 1992; Lyon et al. 1994; reviewed by Bentall and Kinderman, in press). The ASQ requires the subject to come up with a reason for hypothetical positive and negative outcomes, and then to rate that reason on a 7-point internality scale anchored by "totally due to others" and "totally due to me." Interestingly, the self-serving bias is evident in persecutory-deluded subjects' ratings of their causal explanations but is not manifest when independent judges rate the same responses (Kinderman et al. 1992). This suggests that individuals with persecutory delusions make relatively even-handed causal attributions about positive and negative events, but tend to evaluate them in a biased manner. Such an attributional style may preserve self-esteem by allowing the person with persecutory delusions to blame others, rather than oneself, for negative outcomes, and to take credit for positive outcomes (Kinderman et al. 1992).

The self-serving attributional bias is also eliminated when an "opaque" or nonobvious measure of attributional style (i.e., one disguised as a memory task) (Pragmatic Inference Task [PIT]; Winters and Neale 1985) is used (Lyon et al. 1994; however, see Krstev et al. 1999, for less robust findings in a mixed diagnosis, first episode psy-

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chotic sample). Specifically, Lyon et al. found that persons with persecutory delusions displayed an attributional style similar to that of depressed subjects (i.e., internal attributions for negative events and external attributions for positive events), suggesting the presence of an underlying negative self-concept. Conversely, nonclinical and depressed subjects were found to maintain consistent profiles across both measures.

Despite these important findings, there are a number of shortcomings with previous research in this area. First, the majority of the above-cited studies combined samples of individuals with delusional disorder and individuals with schizophrenia into a single group (reviewed in Garety and Freeman 1999). This method is based on the argument to study specific symptoms rather than broad diagnostic categories (Persons 1986; Costello 1992). A number of studies, however, provide evidence that these two disorders are quite different and may entail different etiologies. Specifically, the delusions found in delusional disorder, unlike those sometimes found in schizophrenia, are of a solely nonbizarre nature (Manschreck 1996). Furthermore, there is a relative absence of the pathology commonly found in schizophrenia among individuals with delusional disorder, and they have a significantly later age of onset (Evans et al. 1996; Manschreck 1996). Finally, individuals with delusional disorder require lower doses of neuroleptics compared to individuals with schizophrenia (Evans et al. 1996) and show a better response to pimozide and antidepressants (Munro and Mok 1995; Opler et al. 1995; Manschreck 1996).

A second shortcoming concerns the issue of diagnostic and symptom assessment. Few of the studies in this area have reported the use of standardized structured interviews to make diagnoses. Structured interviews based on behavioral observations could provide greater consistency across studies (Magaro 1980). With respect to symptoms, many of the studies in this area did not use standardized behavioral ratings of current symptoms. This is important in light of the focus on specific symptoms rather than diagnostic groups. Miller and Karoni (1996) contend that this change in focus from diagnostic groups to symptoms has only shifted the locus of the same issues (i.e., reliability and validity of the symptoms), which is especially true when reliable and valid assessments of symptoms are infrequently used.

In light of the issues presented, the present study sought to extend previous work in this area in a few ways. First, study participants were diagnosed and clinically evaluated with standardized, behaviorally anchored measures (i.e., the Structured Clinical Interview for *DSM-IV* and the BPRS-E). Second, the method of combining persons with delusional disorder and schizophrenia into a single group still leaves the question unanswered as to whether the self-serving bias is unique to those with per-

secutory delusions or is also present among individuals with other psychotic features. In order to address this question, this study will compare the attributional style of persons with schizophrenia with persecutory delusions to those with schizophrenia without persecutory delusions on multiple attribution measures (i.e., ASQ; PIT; and the Internal, Personal, and Situational Attributions Questionnaire [IPSAQ, Kinderman and Bentall 1996]). Only one study, to date, has made a similar comparison among samples with schizophrenia (Silverman and Peterson 1993). Silverman and Peterson found that individuals with schizophrenia exhibiting paranoid delusions were more internal for hypothetical positive events on the ASQ than individuals with schizophrenia not exhibiting paranoid delusions, but not significantly more external for negative events. Furthermore, the attributional style of all individuals with schizophrenia did not significantly differ from that of controls. However, this study failed to use standardized interviews or behavioral ratings of subjects to assess current symptoms, and recruitment procedures may have produced a skew toward subjects with higher levels of functioning.

Based on previous research findings and theory (Bentall et al. 1994), we hypothesized that individuals with schizophrenia with persecutory delusions would demonstrate a self-serving bias relative to persons with schizophrenia without persecutory delusions and nonclinical control subjects. Consistent with the recent findings of Kinderman and Bentall (1997), we also hypothesized that the persecutory-deluded group would make many more external-personal attributions for negative events than both the schizophrenia without persecutory delusions group and the control group (i.e., be more likely to blame others rather than situational factors for negative outcomes). Finally, an analysis of attributional style as a function of *who* rates the causal explanations (i.e., subjects themselves or independent raters) may lend insight into the function that such attributions serve. Therefore, we predicted that the self-serving bias for members of the persecutory-deluded group will be manifest only on their own attribution ratings and not on those derived from independent judges.

## Methods

**Participants.** The clinical group was composed of 30 individuals with schizophrenia receiving outpatient services from either a day hospital program or a mental health center. Participants met criteria for schizophrenia based on the Structured Clinical Interview for *DSM-IV*, Patient version (SCID-P; Spitzer et al. 1995), as assessed by independent, trained, and reliable research assistants ( $\kappa$  of at least 0.70 with University of Chicago Center

for Psychiatric Rehabilitation [UCCPR] consensus criteria). Subjects also had to have adequate vision (minimum of 20/30), a reading level at or above the fourth grade, no history of substance abuse within the previous 3 months, and no evidence of brain injury.

The clinical participants' symptomatology was assessed with the BPRS-E, Version 4.0 (Ventura et al. 1993). The BPRS-E is used to assess 24 dimensions of psychiatric symptoms, with each dimension rated on anchored 7-point scales. Ratings can range from 1 (not present) to 7 (extremely severe) and take into account symptom frequency and/or severity. Participants were assessed by research assistants (i.e., doctoral students) who had been trained to a minimum intraclass correlation coefficient (ICC) of 0.80 according to criterion ratings from the UCCPR. Ratings were based on behavioral observations and participants' answers to standard questions posed by the rater in an interview format. For the purposes of this study, symptoms were rated for their occurrence during the 2-week interval prior to and including assessment.

A recent factor analysis of the BPRS revealed *four* factors that will be used in the current study: Affect (anxiety, guilt, hostility, depressive mood, and somatic concern), Anergia (emotional withdrawal, motor coordination, uncooperativeness, and blunted affect), Thought Disorder (grandiosity, suspiciousness, hallucinatory behavior, and unusual thought content), and Disorganization (conceptual disorganization, tension, and mannerism/posturing) (Mueser et al. 1997). This factor structure was selected because it is based on a factor analysis limited to schizophrenia ( $n = 474$ ) and it was replicated (using Structural Equation Modeling) in an independent sample of persons with schizophrenia ( $n = 327$ ), which is unique in schizophrenia research (Mueser, personal communication, June 15, 2000).

Consistent with previous work in this area (Bentall and Kinderman, in press), clinical participants were dichotomized into persecutory-deluded (PD) and non-persecutory-deluded (NPD) groups. Participants were assigned to these groups based on their ratings on the Suspiciousness item from the BPRS. We reasoned that classifying subjects based on symptom severity would allow a more fine-grained analysis of the role of persecutory ideation on attributions than an approach based on broad diagnostic subgroups (i.e., paranoid schizophrenia). A similar approach to group classification has been adopted in other studies on persecutory delusions (e.g., visual scan paths; Phillips et al. 2000).

The endpoints for the BPRS Suspiciousness item are 1 (not present) and 7 ("Delusional—but the beliefs are bizarre and preoccupying." "Patient tends to disclose or act on persecutory delusions."). Subjects were classified

in the PD group if they received a rating of 5 or more on the BPRS Suspiciousness item; a score of 5 is given to respondents who begin to show delusional ideation (i.e., "Says that others are talking about him/her maliciously, have negative intentions, or may harm him/her, more than once per week." "Patient is moderately preoccupied with ideas of persecution OR patient reports persecutory delusions expressed with much doubt" [e.g., partial delusion]; see Appendix A for the behavioral anchors for all ratings.). Therefore, the PD group included subjects with either partial delusions ( $n = 3$ ) or full persecutory delusions ( $n = 12$ ). In this manner, the NPD group was free of subjects showing any evidence of persecutory delusional ideation. Those scoring below a 5 were placed in the NPD group. The majority of subjects in the NPD did not have any delusions ( $n = 9$ ), while the remaining were split among those with grandiose delusions ( $n = 3$ ) and those with delusions of control ( $n = 3$ ).

The nonclinical control (NC) group ( $n = 16$ ) was composed of individuals recruited from the community. Participants were screened for past and present psychiatric symptoms through a brief interview and the BPRS-E, and those with any significant psychiatric problems were excluded from participation. Controls were matched with the experimental group in terms of age, education, gender, and race. Table 1 summarizes the demographic and clinical characteristics of the three groups of subjects. Chi-square tests and one-way analyses of variance (ANOVAs) revealed that the groups did not significantly differ on any of the demographic variables, medication levels, or number of previous hospitalizations. However, one-way ANOVAs conducted on the BPRS scales revealed that, relative to the NPD group, the PD group showed greater affective disturbance and thought disorder. (Note: These group differences in Thought disorder were present even though the Suspiciousness item was excluded from the analyses.) Although this pattern is to be expected, given that these two scales include items typically associated with persecutory beliefs (i.e., hallucinations, hostility), these factors will be included as covariates in subsequent analyses. The two groups did not differ on the Anergia or Disorganization scales ( $p > 0.50$ ) (table 1).

## Materials

**ASQ.** The ASQ consists of 12 hypothetical scenarios. Six of the scenarios are positive (e.g., "you do a project that is highly praised"), and six are negative (e.g., "you meet a friend who acts hostilely toward you") (Peterson et al. 1982). Positive and negative scenarios are ordered in a random fashion. Participants are instructed to vividly imagine the event happening and to provide one major cause of the event. The event is then rated by the respon-

**Table 1. Descriptive statistics for the persecutory-deluded, non-persecutory-deluded, and nonclinical control groups**

	PD (n = 15)	NPD (n = 15)	NC (n = 16)
Gender, n			
Male	8	7	7
Female	7	8	9
Ethnicity, n			
White	5	5	8
African-American	10	10	8
Age, mean (SD)	39.1 (8.7)	34.3 (10.2)	36.8 (9.6)
Education, mean (SD)	11.9 (1.7)	11.9 (1.6)	12.9 (0.9)
No. of prior hospitalizations, mean (SD)	6.5 (4.1)	4.3 (4.2)	NA
CPZ equivalents, mean (SD) <sup>1</sup>	456.7 (253.6)	535.7 (330.0)	NA
BPRS scales, mean (SD)			
Affect	15.0 (5.2) <sup>2a</sup>	10.1 (4.1) <sup>b</sup>	NA
Anergia	7.6 (5.3)	6.5 (3.6)	NA
Thought Disorder	18.1 (2.6) <sup>a</sup>	11.1 (4.1) <sup>b</sup>	NA
Disorganization	5.0 (2.2)	5.2 (1.8)	NA

Note.—CPZ = chlorpromazine; NA = not applicable; NC = nonclinical control; NPD = non-persecutory-deluded; PD = persecutory-deluded; SD = standard deviation.

<sup>1</sup> CPZ equivalents were available for only 18 subjects (PD = 11; NPD = 7).

<sup>2</sup> Groups with different letters significantly differ at  $p < 0.05$ .

dent on each of three dimensions (i.e., internal/external, global/specific, stable/unstable). Consistent with other studies in this area, only the internal/external dimension was administered. Ratings are made on a 7-point scale, ranging from 1 (“totally due to others”) to 7 (“totally due to me”). Scores of internality are obtained by separately summing the responses for positive and negative items.

The internal consistency for the ASQ (Cronbach’s alpha) for the clinical groups was 0.73 for the positive scale and 0.41 for the negative scale, and 0.62 (positive scale) and 0.27 (negative scale) for the NC group, which is consistent with previous research using the ASQ (Reivich 1995).

**PIT.** The PIT was developed by Winters and Neale (1985) as a “nonobvious” measure of attributional style. Items for the PIT were initially drawn from the ASQ and consist of six positive (successful outcome) and six negative (failure outcome) randomly ordered short scenarios that are read to the participant. Embedded in each story is information that implies both an internal cause and an external cause. The PIT is presented as a test of memory requiring the respondent to answer four multiple-choice questions pertaining to each scenario. Two questions pertain to stated facts, one requires a noncausal inference, and the target question requires the respondent to choose between an internal cause and an external cause. Scoring involves computing the number of internal and external attributions for both positive and negative events.

Winters and Neale (1985) found modest internal consistency for this measure, obtaining a Cronbach’s alpha of

0.59 for the positive scale and 0.69 for the negative scale. The present study assessed internal consistency for this measure using the Kuder-Richardson 20 (K-R 20). For the clinical subjects, the K-R 20 for the positive scale was 0.33 and the negative scale 0.14, and 0.41 (positive scale) and 0.24 (negative scale) for the NC group. Similar low reliability coefficients for this measure have been reported elsewhere (Krstev et al. 1999). Given the low reliability, all results obtained with the PIT should be interpreted very cautiously.

**IPSAQ.** The IPSAQ was developed to measure a causal locus (external-personal versus external-situational) believed to be important for persecutory delusions and not measured on the ASQ (Kinderman and Bentall 1996). The IPSAQ consists of 32 hypothetical social situations, 16 with positive outcomes and 16 with negative outcomes. Positive and negative events are randomly ordered in the questionnaire. Respondents are instructed to write down the one most likely cause for each situation. The cause is then categorized by respondents as being something due to themselves (internal attribution), something due to others (external-personal), or something due to the situation (external-situational). Scoring involves summing the number of internal, external-personal, and external-situational attributions for positive and negative events. The authors recommend computing an externalizing bias (EB) score by subtracting the number of negative-internal attributions from the number of positive-internal attributions. A positive EB score represents a strong self-serving bias. A personalizing bias (PB) score

can be calculated by dividing the number of external-personal attributions for negative events by the sum of both external-personal and -situational attributions for negative events. A PB score over 0.5 would represent a tendency to use personal rather than situational external attributions for negative events.

Kinderman and Bentall (1996) report satisfactory internal reliability for this instrument, with a mean alpha of 0.675. For the present study, the reliability (Cronbach's alpha) for the clinical subjects was 0.85 for the positive scale and 0.81 for the negative scale, and 0.68 (positive scale) and 0.74 (negative scale) for the NC group.

**Procedures.** Participants' current symptomatology was assessed with the BPRS-E. They were then individually administered the ASQ, PIT, and IPSAQ. To control for order of presentation effects, subjects were randomly assigned to one of six possible orders of presentation. All instructions and questions were read directly to participants by the examiners. For the ASQ and IPSAQ, subjects were asked to generate causes for each outcome and then to rate each causal statement using the 7-point scale on the ASQ and the forced-choice options on the IPSAQ (i.e., "due to self," "others," or "the situation"). A pair of independent raters, blind to study hypotheses and identifying information, later rated subjects' causal statements from the ASQ and IPSAQ using the same scales. Good ICCs were obtained between raters for the 12 individual items on the ASQ (between 0.71 and 0.97). Kappa agreement was computed between raters on the IPSAQ and found to be high for the individual items (between 0.70 and 1.00).

## Results

**Subjects' Ratings.** To test the hypothesis that a greater self-serving bias would be present in the PD group than in the other two groups, a series of 2 (event; positive vs. negative)  $\times$  3 (group; PD, NPD, NC) ANOVAs were conducted on the attribution scores for each of the three measures (i.e., ASQ, PIT, IPSAQ) (table 2). For each analysis, Bonferroni correction was applied to control type I error (i.e., alpha = 0.008 [0.05/6]). With respect to the ASQ, a significant main effect was found for event ( $F[1, 43] = 23.07, p < 0.0001$ ), indicating that all participants exhibited a self-serving bias. The main effect for group ( $F[2, 43] = 1.81, p = 0.176$ ) and the group  $\times$  event interaction ( $F[2, 43] = 0.27, p = 0.763$ ) were both not significant.

On the PIT (table 2), the effects for group, event, and interaction were all not significant ( $p > 0.10$ ). Thus, there was no evidence of a self-serving bias nor a reversal of this bias for the PD subjects (e.g., Lyon et al. 1994). For the IPSAQ, a 2  $\times$  3 ANOVA conducted on the internality scores revealed a significant effect for event ( $F[1, 43] =$

11.36,  $p = 0.002$ ), although the main effect for group ( $F[2, 43] = 1.18, p = 0.316$ ) and the group  $\times$  event interaction ( $F[2, 43] = 0.40, p = 0.675$ ) were not significant. Thus, consistent with the results obtained from the ASQ, all groups showed a self-serving bias.

To test the second hypothesis, that the PD group would make more external-personal attributions for negative events than the other two groups, a 3 (group)  $\times$  2 (event) ANOVA was conducted on the external-personal and external-situational dimensions (table 2). The only significant effect was for event type for the external-personal variable ( $F[1, 43] = 13.20, p = 0.001$ ); all subjects were more likely to blame others for negative compared to positive outcomes. All other main effects and interactions were not significant ( $p > 0.50$ ).

EB and PB scores were computed for all participants and analyzed using separate one-way ANOVAs. There were no significant differences between groups in the degree of EB ( $F[2, 43] = 0.397, p = 0.675$ ) or PB ( $F[2, 43] = 0.209, p = 0.813$ ). According to Kinderman and Bentall (1996), positive EB scores represent a strong self-serving bias and PB scores over 0.5 represent a tendency to blame others rather than situational factors for negative outcomes. Closer inspection of the data in table 2 reveals that all three groups provided positive EB and PB scores greater than 0.5. Thus, all three groups showed a self-serving bias and a tendency to blame others, rather than situations, for negative outcomes.

Because the two clinical groups differed on the BPRS Affect and Thought Disorder factors, the above analyses were repeated including these factors as covariates. The results were unchanged.

**Independent Ratings.** On the basis of previous findings, it was expected there would be a discrepancy between the PD group and independent judges' attributional ratings of the PD group's causal statements. To examine this pattern, we conducted a series of 2 (event; positive vs. negative)  $\times$  3 (group; PD, NPD, NC) ANOVAs on the independent ratings of subjects' causal statements from the ASQ and IPSAQ. On the ASQ, a significant main effect was found for event ( $F[1, 43] = 11.38, p = 0.002$ ) (table 2); independent judges rated all subjects as exhibiting a self-serving bias in their causal statements. The effect for group ( $F[2, 43] = 0.01, p = 0.993$ ) and the group  $\times$  event interaction ( $F[2, 43] = 1.39, p = 0.259$ ) were both not significant. Conversely, there were no significant main effects for group, event, or the group  $\times$  event interaction for IPSAQ internality ratings ( $p > 0.20$ ), indicating an absence of the self-serving bias for all subjects on this measure. Thus, using a more reliable attributional measure, the self-serving bias observed for subjects' own ratings disappeared on the independent ratings.

**Table 2. Means and standard deviations of subjects' and independent judges' ratings on the attribution measures (ASQ, PIT, IPSAQ) for the persecutory-deluded, non-persecutory-deluded, and nonclinical control groups**

Attributional measure	PD, mean (SD)	NPD, mean (SD)	NC, mean (SD)
<b>Subjects' Ratings</b>			
ASQ			
Positive	31.3 (8.5)	33.9 (7.2)	32.1 (5.7)
Negative	24.1 (6.6)	28.7 (6.4)	26.7 (6.2)
PIT			
Positive	3.4 (1.6)	2.7 (1.1)	3.0 (1.4)
Negative	3.3 (1.1)	3.6 (1.5)	2.6 (1.2)
IPSAQ			
Internal			
Positive	6.6 (3.8)	8.1 (4.5)	8.8 (3.2)
Negative	4.9 (3.1)	6.2 (3.8)	5.8 (3.8)
External-personal			
Positive	5.1 (2.2)	4.2 (3.3)	4.3 (3.4)
Negative	6.7 (2.9)	6.5 (3.1)	6.5 (4.2)
External-situational			
Positive	4.3 (3.8)	3.5 (3.1)	3.0 (2.4)
Negative	4.3 (3.7)	3.3 (3.4)	3.8 (3.5)
EB	1.7 (3.2)	1.9 (5.2)	3.0 (4.7)
PB	0.64 (0.30)	0.70 (0.26)	0.65 (0.33)
<b>Judges' Ratings</b>			
ASQ			
Positive	30.7 (5.3)	32.1 (4.0)	32.4 (4.0)
Negative	29.8 (5.9)	28.2 (4.6)	28.1 (5.8)
IPSAQ			
Internal			
Positive	9.1 (2.3)	7.5 (3.0)	7.8 (3.2)
Negative	8.5 (4.3)	8.9 (3.3)	6.7 (4.1)
External-personal			
Positive	5.7 (2.6)	7.3 (2.8)	4.1 (3.7)
Negative	7.1 (4.2)	6.5 (3.4)	8.2 (4.5)
External-situational			
Positive	1.3 (1.5)	1.0 (1.2)	4.1 (2.1)
Negative	0.4 (0.6)	0.6 (1.1)	1.1 (1.4)
EB	0.6 (3.4)	-1.3 (3.7)	1.1 (3.9)
PB	0.95 (0.07)	0.91 (1.40)	0.84 (0.19)

*Note.*—ASQ = Attributional Style Questionnaire; EB = externalizing bias; IPSAQ = Internal, Personal, and Situational Attributions Questionnaire; NC = nonclinical control; NPD = non-persecutory-deluded; PB = personalizing bias; PD = persecutory-deluded; PIT = Pragmatic Inference Task; SD = standard deviation.

With respect to the independent ratings on the external-personal dimension (i.e., on the IPSAQ), there were no significant main effects for group ( $p > 0.5$ ), although there was a significant main effect for event ( $F[1, 43] = 8.54, p = 0.006$ ). This main effect, however, is qualified by a significant group  $\times$  event interaction ( $F[2, 43] = 6.50, p = 0.003$ ). Probing of the interaction revealed that the NC group was more likely to use others to explain

negative compared to positive outcomes ( $t(15) = -4.22, p = 0.001$ ).

For the external-situational dimension, there were significant main effects for group, event, and the group  $\times$  event interaction ( $p < 0.001$ ). Closer inspection of the interaction revealed that the NC group members were rated as more likely to use situational explanations for positive compared to negative outcomes ( $t[15] = 4.53, p <$

0.001), and they were more likely to use situational explanations for positive outcomes relative to both of the clinical groups ( $p < 0.0001$ ).

To further examine data from the IPSAQ, one-way ANOVAs were conducted on the EB and PB scores derived from the independent ratings. No significant differences were found between groups with respect to EB ( $F[2, 43] = 1.92, p = 0.16$ ). Although two groups (PD and NC) obtained positive EB scores, a closer examination of the means used to derive these scores (internal-positive and internal-negative) reveals the actual magnitude of bias to be very minimal. The difference between groups for PB scores approached conventional significance levels ( $F[2, 43] = 2.64, p = 0.08$ ). A post hoc least significant difference test revealed that the PD group was rated as more likely to blame others rather than situational factors for negative outcomes compared to the NC group ( $p < 0.05$ ), although all groups demonstrated this bias (i.e., all PB scores  $> 0.5$ ).

The analyses of the independent ratings of subjects' attributional statements indicate that on IPSAQ, the self-serving bias observed for subjects' own ratings disappeared. Furthermore, while all subjects showed a tendency to use others to explain negative rather than positive events based on their own ratings, this pattern remained for only the NC group on the independent judges' ratings. Finally, when looking specifically at external attributions, there was a trend for only the PD group to blame others rather than situations across ratings from both subjects and judges.

To further examine the differences between subjects' and judges' independent ratings, we conducted a series of *t* tests on the internality and bias scores on the ASQ and IPSAQ. We did not include the IPSAQ external-personal and external-situational dimensions in the analyses, as they are somewhat redundant with the bias scores. For the internality dimension, the only significant difference was for negative events on both the ASQ and IPSAQ for the PD group; independent judges rated the PD group as more internal for negative events compared to subjects' own ratings ( $p < 0.01$ ), a finding consistent with Kinderman et al. (1992). When only external attributions were considered, both clinical groups showed a greater PB based on judges' ratings than based on their own ratings ( $p < 0.005$ ). In summary, for negative outcomes, the independent judges saw the PD group as more likely to blame themselves and to choose blaming others rather than situations, compared to how the PD subjects viewed their own attributions.

The above analyses of the independent ratings were repeated with the BPRS Affect and Thought Disorder factors included separately as covariates. In general, the results were unchanged from the original analyses. The

only exception occurred for the significant group  $\times$  event interaction for the external-situational dimension, which was no longer statistically significant when controlling for the Thought Disorder factor; the PD subjects now showed a tendency to use situational explanations for positive more than for negative outcomes ( $p = 0.053$ ).

**Supplementary Analyses.** Although the purpose of the present study was to examine attributional differences between persons with schizophrenia with persecutory delusions and persons with schizophrenia without persecutory delusions, it could be argued that dichotomizing subjects into PD and NPD groups based on suspiciousness scores from the BPRS-E is an artificial distinction. Specifically, even though subjects may not have persecutory delusions, they may still exhibit varying degrees of persecutory ideation and suspiciousness. As such, a correlational rather than between-group analysis might be more consistent with the "symptom" approach and a more valid test of the attributional model for persecutory delusions. Because the suspiciousness item of the BPRS-E provides ratings of persecution on a continuum, Pearson correlations between this item and the attributional variables were conducted for only the subjects with schizophrenia. Based on Bentall et al.'s (1994) model, it is expected that a greater self-serving bias would be associated with increasing suspiciousness; therefore, one-tailed tests were used. For subjects' own attributional ratings, no significant correlations were found between suspiciousness and attributions ( $p > 0.20$ ). However, correlations between suspiciousness and the independent ratings from the ASQ and IPSAQ revealed a significant positive correlation between suspiciousness and attributions for positive events on the internality dimension of the IPSAQ ( $r = 0.43, p = 0.009$ ), and a significant negative correlation between suspiciousness and independent ratings for positive events for the external-personal dimension of the IPSAQ ( $r = -0.40, p = 0.015$ ). All other correlations were not significant ( $p > 0.09$ ). Thus, based on independent ratings, there was a linear association between greater suspiciousness and a tendency to attribute positive outcomes to internal factors and a reduced tendency to attribute such outcomes to others. This provides additional evidence of a self-serving bias with increasing levels of persecution among outpatients with schizophrenia.

## Discussion

The present study examined the attributional style of outpatients with schizophrenia with and without persecutory delusions. Three major findings emerged from the analyses. First, evidence of a self-serving bias was found among subjects with persecutory delusions on two mea-

asures of attributional style (i.e., the ASQ and IPSAQ). However, this bias was not unique to those with persecutory delusions, and it disappeared when independent raters evaluated subjects' causal statements on a reliable measure of attributional style (i.e., the IPSAQ). Second, all subjects showed a PB (i.e., attributing greater blame to others than to situational factors for negative outcomes), although there was a statistical trend for this bias to be strongest among PD subjects. Finally, there were significant discrepancies between the independent judges' and PD subjects' own ratings of their attributional statements.

The hypothesis that the PD group, relative to the NPD and NC groups, would exhibit a larger self-serving bias was generally not supported. These findings are in contrast to previous findings of an exaggerated self-serving bias among individuals with paranoid and/or persecutory delusions (e.g., Kaney and Bentall 1989; Candido and Romney 1990; Kinderman et al. 1992; Lyon et al. 1994). Moreover, on a "nonobvious" measure of attributional style, PD subjects did not demonstrate the expected reversal of the self-serving bias (Lyon et al. 1994). However, as noted in the introduction, not all studies have found attributional style differences between persons with persecutory delusions and control subjects (e.g., Kinderman and Bentall 1997; reviewed by Garety and Freeman 1999). Thus, the exaggerated self-serving bias associated with persecutory delusions is apparent in some studies and not others.

A number of factors may account for the contradictory findings. First, this study examined diagnostically homogeneous groups by excluding individuals with delusional disorder. As noted previously, delusional disorder has a different etiology and clinical picture than schizophrenia. The practice of combining individuals with delusional disorder and individuals with schizophrenia into a single group may have affected previous findings. This is especially relevant considering that the only study using only individuals with schizophrenia (Silverman and Peterson 1993) failed to find evidence of an exaggerated self-serving bias relative to controls, whereas a study using only individuals with delusional disorder (Fear et al. 1996) found evidence of a larger self-serving bias relative to controls (i.e., all subjects with delusional disorder were more external for negative events). Therefore, the formation of groups based on symptoms from different clinical groups may have confounded previous research in this area.

Furthermore, many of the previous studies in this area included a depressive control group in the design (reviewed by Garety and Freeman 1999). Having a depressed control group in the current study might have increased the likelihood of finding an accentuated self-serving bias in the PD group, as depressed subjects tend

to show the *opposite* attributional pattern (i.e., taking credit for failure and denying responsibility for success). Alternatively, it is possible that individuals with schizophrenia without persecutory delusions share some attributional characteristics with those with persecutory delusions. Thus, schizophrenia or psychosis in general, rather than persecutory ideation in particular, may underlie attributional style.

A final explanation for the inconsistent pattern of results relates to the internal reliability of attribution measures. Reivich (1995) reported that the reliability of the ASQ has been found to be generally unsatisfactory, particularly for the negative internal scale. Many of the studies showing a self-serving bias have used the ASQ, in particular the internal-external dimension. Given the questionable reliability of the ASQ, and the poor reliability of the PIT reported in this study (also reported in Krstev et al. 1999), the inability to replicate previous findings is not surprising. Moreover, it is noted that when a more reliable measure was used (i.e., the IPSAQ), findings of an "exaggerated" self-serving bias (relative to nonclinical controls) among persons with paranoid delusions were eliminated (e.g., Kinderman and Bentall 1997).

The hypothesis that persons with persecutory delusions would be more likely to blame others than situations for negative outcomes was partially supported. Although all three groups showed this PB, there was a trend, based on the independent ratings for this bias, for PB to be strongest in the PD group. Thus, when confronted with a negative outcome, individuals with persecutory delusions were especially likely to blame others, an attributional style that could partially explain the association between paranoia and violent behavior (Swanson et al. 1996, 1997).

The third hypothesis, that the PD subjects would demonstrate differences between their own relative to independent ratings of their attributional statements, was only partially supported. For all three groups, the self-serving bias evident for their own ratings on the IPSAQ was no longer present on the judges' ratings. Thus, all subjects tended to make relatively even-handed internal attributions, which they interpreted in a self-serving manner, consistent with previous findings reported with deluded subjects (i.e., Kinderman et al. 1992). Interestingly, the PD subjects were the only group to be rated by the independent judges as being more internal for negative events than how they had rated themselves. This finding may be consistent with the defensive function that attributions serve for individuals with persecutory delusions (Bentall et al. 1994); after blaming themselves for negative outcomes, subjects with persecutory delusions feel their self-esteem threatened, resulting in a self-serving attributional bias. Of course, an alternative interpreta-



tion is that persons with persecutory delusions are not reliable evaluators of their own attributions. An experimental design in which the attributional style of persons with persecutory delusions is assessed prior to, and following, a negative event may shed light on this issue.

Two other findings should be briefly mentioned. First, considering only the subjects with schizophrenia, persecutory ideation was positively associated with internal attributions for positive outcomes and negatively related to attributing such events to others. This finding is consistent with Bentall et al.'s (1994) model of an association between paranoia and a self-serving bias. In fact, given the presence of the self-serving bias in all subjects, this finding raises the question of whether the mechanism underlying the self-serving bias is different for clinical and nonclinical subjects. And second, the independent judges rated the subjects with schizophrenia (both PD and NPD) as more likely to blame others for negative outcomes relative to subjects' own ratings. Thus, subjects with schizophrenia might misinterpret their own attributions, which may be consistent with their problems in perspective taking (Harrow et al. 1989). Alternatively, persons with schizophrenia may see themselves as more fair (to others) than they really are, which, again, might serve some type of psychological function. At this point, however, there are no data to support either hypothesis.

The attributional differences between the subjects with persecutory delusions' own and others' ratings may be understood within the context of models of impression formation based on nonclinical samples. Specifically, Gilbert et al. (1988) posit that when forming impressions of others, three stages of social information processing occur: identification of the target's behavior, automatic dispositional inference, and correction for situational factors. For example, observing someone yelling at another person (i.e., identification) results in an automatic dispositional inference (e.g., "That person is mean-spirited"), followed by correction for situational factors (e.g., "His yelling was justified because he just had his wallet stolen"). With respect to persecutory ideation, one could argue that the independent judges' ratings reflect subjects' automatic dispositional inferences (stage 2), while subjects' own ratings are indicative of a type of correction factor (stage 3). Thus, for negative events, subjects with persecutory delusions may automatically make internal attributions, which they later correct (based on their own ratings) to be more external. When this model is applied to only external attributions (i.e., on the IPSAQ), subjects with persecutory delusions automatically blame others for negative outcomes (i.e., stage 2), which, again, are later corrected to reflect situational, rather than personal, causes (i.e., stage 3). Thus, understood within Gilbert et al.'s (1988) model, persons with persecutory delusions

tend to automatically blame themselves or others, but then depersonalize others, by explaining the causes in a situational manner.

There are a few study limitations in need of mention. First, only outpatients with schizophrenia were used. It is possible that the attributional bias in question may be more prevalent among inpatient populations who are more severely ill (i.e., have higher levels of persecutory ideation). As such, generalizability of the study findings to the population of individuals with schizophrenia may be limited. Second, the group sample sizes were rather small. However, most of the nonsignificant results were associated with small effect sizes (i.e., eta squared < 0.085), suggesting that a larger sample size might not have considerably changed the results. Third, we did not have any information on subjects' *lifetime* history of persecutory delusions. Therefore, it is unclear whether the pattern of findings is due to current persecutory ideation or a lifetime history of it.

Fourth, the NPD group comprised individuals who either had no delusions ( $n = 9$ ) or who had non-persecutory delusions (i.e., delusions of control [ $n = 3$ ] and grandiosity [ $n = 3$ ]). Thus, one could argue that the NPD group had some symptom heterogeneity. To address this issue, we repeated the study analyses, removing participants from the NPD with "other" delusions; the results were unchanged. It should be noted that we didn't repeat these analyses including only those with delusions in the NPD group because the sample size was small ( $n = 6$ ) and the delusional content was not uniform for these participants. Therefore, the clinical heterogeneity in the NPD group did not affect the observed results. It may be worthwhile, however, for future research to examine attributional style in larger samples of persons with schizophrenia in those with persecutory delusions, other delusions, and no delusions.

Finally, the clinical groups were dichotomized based on a single item from the BPRS-E rather than a scale (e.g., the hostility scale from the original BPRS). This criterion was used because the suspiciousness item appears to best represent the persecution construct. Furthermore, 83 percent of the subjects with schizophrenia (i.e., 83.3%) had BPRS-E scores that were at least 1 point away from the classification criterion of 5 (i.e.,  $3 \leq$  or  $\geq 6$ ). This suggests that most subjects were rated along the endpoints of the persecution continuum rather than at the borderline of persecutory ideation. Furthermore, the study results were unchanged when the three participants with partial delusions were removed from the PD group. Finally, a followup analysis revealed that the PD group had significantly higher ratings on the BPRS depression item ( $M = 3.3$ ) relative to the NPD group ( $M = 1.7$ ), a finding that is consistent with Bentall

et al.'s (1994) model and lends indirect support for our classification criterion.

Future research should examine the attributional style of persons with persecutory delusions for actual, rather than imaginary, outcomes. Both the ASQ and IPSAQ are composed of *hypothetical* events that the respondent is asked to imagine occurring to him or her. However, there is some question as to whether these events serve as a reasonable proxy for real-life events. In a critical review of studies investigating the relation between attributional style and depression, Robins and Hayes (1995) found a fairly strong concurrent relation between depression and attributions for hypothetical negative events. Evidence of a concurrent relation between depression and actual negative events, however, was much weaker. Furthermore, little or no support was found for a prospective relationship between causal attributions for hypothetical events and depression. Therefore, it is questionable whether these instruments accurately reflect the attributions individuals would make for real-life situations. This, in turn, suggests that an investigation of attributional style in PD persons for actual events would be a worthy endeavor.

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